Vol. VIII. No. 10
25 Cents a Copy

American Cinematographer

U. S. Postage
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Permit No. 941
Los Angeles, Calif.

Jan., 1928

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Vol. VIII January, 1928 No. 10

American Cinematographer

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Technical Editor

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An educational and instructive publication, espousing progress and art in motion picture photography.

Subscription: United States, $3.00 a year; Canada, $3.50 a year; foreign, $4.00 a year; single copies, 25c.

Published monthly by
THE AMERICAN SOCIETY OF CINEMATOGRAPHERS, INC.

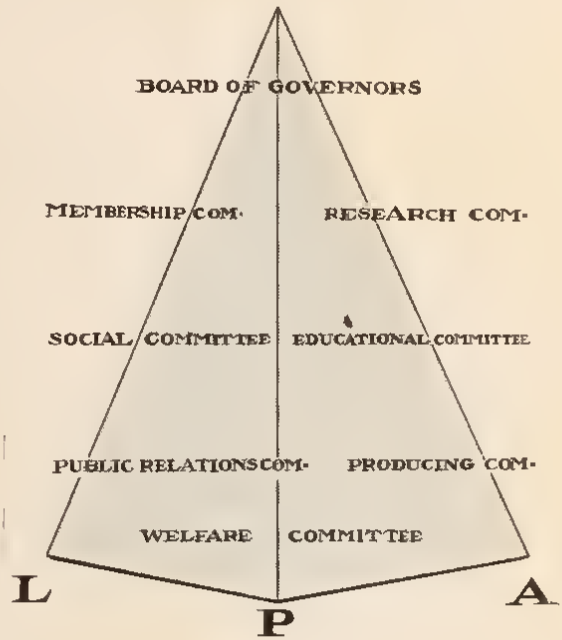
Advertising rates on application.

1219-20-21-22 Guaranty Building, Hollywood, Calif.

Telephone GRanite 4274.

A. S. C.

The Pyramid of Progress



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New Mitchell Product

Enterprising Hollywood Concern Introduces a New Camera Pull-Down Mechanism

By GEORGE A. MITCHELL

of the Mitchell Camera Corporation, Hollywood, California

The use of miniatures in motion picture productions, where a part of the scene is normal action, and part built to a smaller scale, especially where there is action in both exposures, has called for a positive acting high speed movement. In the taking of these scenes it has been customary to employ two cameras, one for the high speed or miniature, and another for the normal takes.

In the photography of animals especially, and other scenes, it is desirable to have a camera which operates as quickly as possible.

The following is a brief description of a movement designed to meet these requirements.

Fig. 1 shows the movement unit, the gear box, the driving shaft and large crank. The movement is inter-

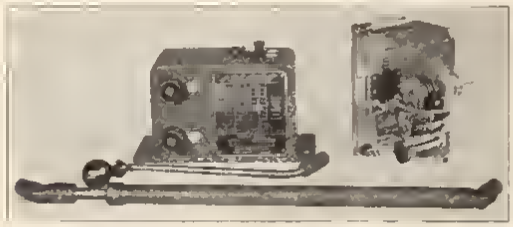


Fig. 1

changeable in any of our cameras, no machine work being necessary. On the gear box are three places to attach the crank, and two places to attach the driving shaft. On the top of the box is a gear shift lever, and with this arrangement, eleven speed changes are possible, from 2-128 pictures per second, the operator turning the crank 120 per minute, or normal.

The extension shaft has a "V" groove on each side and corresponding grooves in the outer casing. These

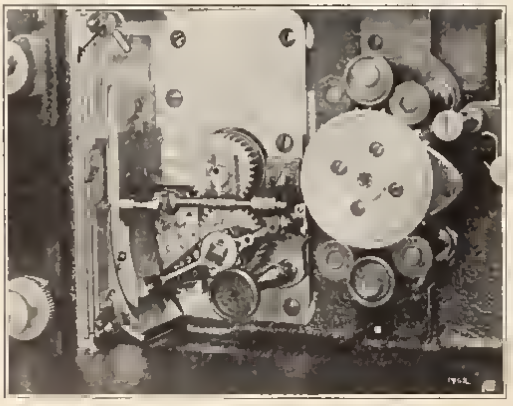


Fig. 2

grooves form a ball race, and instead of keys we use balls to drive. By this method no end thrust can be transmitted to the camera.

Fig 2 is a larger view of the movement mechanism, showing the pilot pins in the film, and the pull-down claws disengaged and returning to the top position. Two claws are used on each side for pulling the film, and the claws and pilot pins overlap, one entering before the other disengages.

The pull-down member slides in part A, and pivots at the same point. Two cams of the same design but of different throw operate the pull-down and pilot pins. The pull-down arm, is moved to the rear as shown in Fig. 3, while the pilot pins are disengaged, enabling the operator to slide the film in slot D.

This slot will accommodate two thicknesses of film for special work, and matting 1/16 of an inch in front of the film may be done at opening E. By loosening two clamps, FF, the front plate may be easily withdrawn for cleaning. The pressure plate is made with two rollers in the center of the aperture, and two steel shoes over

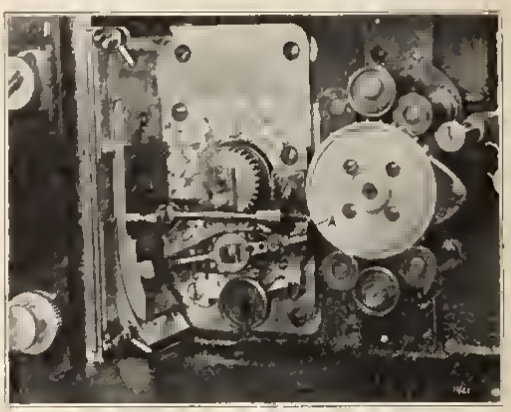


Fig. 3

the perforations, so that no prssure is on the picture area. This has a constant pressure of a very light spring. The rollers are made of ebony, with a steel core. The film race is of stainless steel.

BLASTING CAP FILM

As a part of a nation-wide safety campaign designed to minimize the number of blasting cap accidents in which children suffer injury or death, the Institute of Makers of Explosives recently completed a one-reel motion picture film entitled "How Jimmy Won the Game," designed to emphasize the danger to children of using the blasting cap as a plaything. The film is printed on safety stock and will be screened in the public and parochial schools in those states where most of the blasting cap accidents occur. It is estimated that 500 children are maimed or killed every year in these accidents.

S. M. P. E. Transactions

Discussion On "The Tungsten Lamp Situation In the Studio"

[This paper, read at the Lake Placid convention of the S. M. P. E., was published in full in the American Cinematographer for November. — Editor's Note.]

By PETER MOLE

MR. BECGS—About a year ago I tried to calculate the theoretical costs of lighting a studio with mazda lamps. At that time it was felt that mazda lamps were impossible, but calculations made theoretically showed that the costs were approximately the same as for arcs. Now, the film is a little faster for incandescents, and labor costs have been calculated closer, so that the figures I published at that time do not necessarily apply for mazda lamps, although at that time it was about a toss-up for cost for lamps, fixtures and labor. Since that time we have been asked to produce a metal reflector. It is not so efficient as silvered glass, but it is indestructible, and chromium has been found to be the most successful plating. The advantages are chiefly that it is easily cleaned. Chromium is going to be very popular as a surface plating material. Probably you noticed that the Kodascope projector used it, and it is being used in the lighting field for industry.

I should like to ask Mr. Farnham about the over-voltage operation of lamps. Any of these incandescent lamps can be burned with over-voltage with reasonable assurance that it will give fair photographic performance, but it may destroy the lamp, and there should be an agreement among studio engineers, I believe, concerning the exact over-voltage which should be used.

Another point is the avoidance wherever possible of these extremely expensive lamps; $175 is the present price of the 10 kilowatt lamp with 100 hours' life. The same light flux can be obtained from ten 1000-watt lamps for $2.50 each, which gives a different total price, and it seems unreasonable that studio engineers should insist on using the very expensive lamps. I think they might get together a symposium on the use of incandescent lamps for studio engineers.

MR. FARNHAM—With reference to operating lamps at an over-voltage, the studios now working with incandescent lamps operate them from the same source of supply that they operate their arc equipment, and hence it is not practicable to operate the lamps at other than the voltage of the circuit without causing trouble on other sets that are using the same source of supply.

The light output of an incandescent lamp operating at from 250 to 400 hours' life has the correct color characteristics for use with the Panchromatic film, and if they were operated at an over-voltage a relatively greater increase in the blues and violets would result, and the color renedition would not be correct. Instead of over-voltaging a lamp at the time the picture is being taken, I would suggest the practice of operating lamps at an under-voltage during rehearsing and at times when it is not necessary to expose the film, and then before the picture is to be taken the lamps should be brought up to normal voltage.

In considering future practice where the lamps are operated directly from alternating current source it would be a simple matter to install a portable induction regulator between the supply circuit entering the building and the particular set on which it is desired to control the current. This would make it possible to operate the lamps at an under-voltage until the time to make the picture, when they could be quickly brought up to full voltage.

The use of this device would likewise permit bringing lamps from total darkness to full brilliancy or from full brilliancy to total darkness for special lighting effects, duplications of sunrise and sunset scenes, etc.

With reference to Mr. Beggs' point that it would be more desirable to use ten 1000-watt lamps instead off one 10,000-watt lamp; this might be practical in some cases, but there are many instances where it is desired to create the effect of strong sunlight streaming in through a window or door, the intensity of this source must be considerably greater than that of the other light source illuminating the set. For this purpose a single source of high-wattage such as 10-killowatt lamps would be required. Ten 1000-watt lamps would be quite out of the question because they would create ten individual shadows and spoil the illusion of sunlight.

MR. ISAACS—I should like to ask Mr. Farnham what the advantage would be of cutting back from DC to AC when the latter gives flicker.

MR. FARNHAM—A mazda lamp operates equally well on alternating or direct current. The studios would naturally not wish to discard their existing motor generator sets, but as the present equipment becomes obsolete or greater lighting capacity is required, they would gradually shift to AC operation and thus remove the heavy investment in substations and the necessary attendant which rotating equipment requires. With regard to flicker on alternating current circuits due to the relatively small size filament wire of the 100-watt lamps and those of lesser wattage, there is a noticeable flicker when the lamps are operated on 25-cycle currents. On 60-cycle currents this flicker cannot be detected with the eye, but it can be observed by strohoscopic methods. However, as we increase the wattage of the lamps and hence the diameter or mass of the filament wire, the heat storage capacity of the filament becomes greater and the fluctuations of the light, due to the cyclic variations of the current, becomes less. From tests which we have conducted using a special stroboscopic device, we find that fluctuation of the light disappears with lamps of 500 watt, 115 volt ratings and above on 60 cycle circuits. In the studio district 50 cycle circuits are the rule so that it is probable that the 750 watt lamps would mark the dividing line between flicker and non-flicker. Since all of the lamps employed in studio lighting service are of 1000 watts and above, I can assure you that there will be no possibility of flicker caused by the shutter getting into synchronism with the alternating current cyclic changes.

MR. BAUER: Some years ago Westinghouse went into the problem of sufficiently heavy filaments in incandescent lamps. As Mr. Farnham says, it frequently happened that the synchronism mentioned was noticeable on the screen as a decided flicker. The result of their investigation was that they brought out a transformer with 20 ampere 20 volt light which is equivalent to 400 watts. In an ordinary 400 watt incandescent lamp, the flicker would persist, but with the 20 volt 20 ampere lamp, the filament was sufficiently heavy to prevent this.

MR. CRABTREE: I should like to mention that in the studio in Rochester for taking color motion pictures it is our practice to burn the lamps at under-voltage during actual exposure. This is done by means of rheostats.

MR. BEGGS: All the prize fights are photographed in the light of incandescent lamps. At Chicago they used 44 one thousand watt lamps in 44 reflectors These burned at normal voltage and were of the ordinary type

(Continued on Page 16)

Amateur Cinematography

A Professional's Notes for Amateurs—XV

By JOSEPH A. DUBRAY, A. S. C.

(Continued from December Cinematographer)

In the previous chapters it has been established that the orthoscopic formation of images by spherical lenses is subordinate to the correction of a number of imperfections called aberrations and it has been stated that such correction is possible by the proper selection of glasses, by the combination of several lenses of different form and material, by the curvature of the surfaces of the lenses, their distance apart and by the limitation of a certain number of rays that concur to form the image.

It is quite evident that a number of problems have arisen from such complex generalities and that a number of objectives have been calculated, designed and constructed, each one presenting a certain marked improvement in one or the other of the fields of correction, thus making each instrument especially suitable for certain working conditions or certain desirable results.

This has given rise to a number of denominations which have come down to us since the beginning of the perfectment of photographic objectives, such as **Single Achromat, Rectilinear, Portrait lens, Anastigmat,** etc., which in turn have given rise to a number of different objectives bearing a trade name or the name of the inventor and so known by the photographic world.

It would be impossible to analyze in this series of articles all the different makes of objectives and their attributes. A great deal of literature is available on this subject and I shall therefore confine myself to generalities.

While discussing the different aberrations of lenses it has been found that these aberrations could be destroyed, neutralized or minimized under certain specified conditions.

Chromatic aberration can thus be corrected by compounding a lens with two different kind of glasses. Astigmatism is also removed by making use of different kinds of optical glasses so designed that the components produce astigmatism of contrary kind which will neutralize each other.

Spherical aberration is corrected by the proper curving of the lenses' surface and their position in respect to the incident light, which curvatures are calculated keeping in view the fact that they have an influence in the correction of the chromatic aberration.

In a general way of expression it can be said that the methods by which the different aberrations can be corrected dove-tail, so to speak, into each other. It is thus possible to compound several lenses into an objective, which finally present the greatest possible correction for all its aberrations.

Let us supose a convergent achromatic lens formed by the combination of one positive plano convex crown glass and one negative plano concave flint glass lens. The image formed by such compound will be chromatically corrected, but will present spherical aberration and astigmatism as well.

If the plano surfaces of the two lenses be curved so that they coincide with each other, three radii of curvature will then be at the disposal of the designer and the spherical aberration present in the first system may be greatly corrected in the second.

The necessity of limiting the number of rays that may be allowed to concur in the formation of the image requires, as previously stated, the use of a stop or diaphram. The use of such a stop would, although reducing the astigmatic aberration as well as the spherical, tend to produce a distortion in the image. The remedy for this distortion is to construct the objective of two separate components, both chromatically and spherically corrected, and to place the stop or diaphram between them, which principle is followed in the designing of all modern photographic objectives.

The diaphram defines thus the bounds of the photographic objectives, limits the rays permitted to concur to the formation of the image and is, therefore, of paramount importance, not only for its action in the correction of aberrations, but also because it determines the luminosity of the image and consequently the so-called **Speed** of the objective—

Let us now suppose an objective constructed according to the above mentioned data, i. e., composed of two achromatic lenses symmetrically placed on a common axis and separated by a diaphram symmetrically set in respect to the lenses, and let the two lenses be made of similar kinds of glasses and having the same focal length.

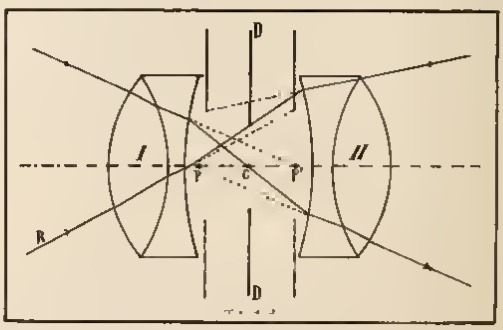
If, by means of such an objective, we bring to a focus on a ground glass an object-point situated on its axis and we then exclude all the light in the object-plane and illuminate the ground-glass from the back, then when we place the eye in the same position at which the object-point was, we will see a bright circle, which is the virtual image of the diaphragm formed by the components of the objective which are **situated between the eye and the diaphragm itself.**

If we reverse the operation and place the ground glass where the object-point was and replace the ground glass by the object-point itself, through the same proceedings we find that the components of the objective situated at the opposite side of the diaphragm also form a virtual image of the diaphragm which will be exactly similar to the first, due to the symmetrical construction of the objective under consideration.

The diaphragm itself is called the Aperture Stop; its image formed by the component of the objective preceding it on the side facing the object is called the Entrance Pupil and its image formed by the components of the objective on the side facing the image is called the Exit Pupil.

The terms **entrance** and **exit pupils** have been introduced by Professor Abbe, of Jena, and their amplitude determines the exact dimension of the cone of rays from an object point which is concurring to form its image on the ground glass.

Let us consider now, an objective constructed according to the limitations expressed above, as symmetry of the system:



Let I and II be respectively the front and back components of the objective and D. the diaphragm or stop.

Let us take into consideration any ray passing through the center of the diaphragm at C. Due to the symmetry of the components of the objective and of the diaphragm in respect to them, such ray will meet

(Continued on Page 17)

The Lubrication of Motion Picture Film

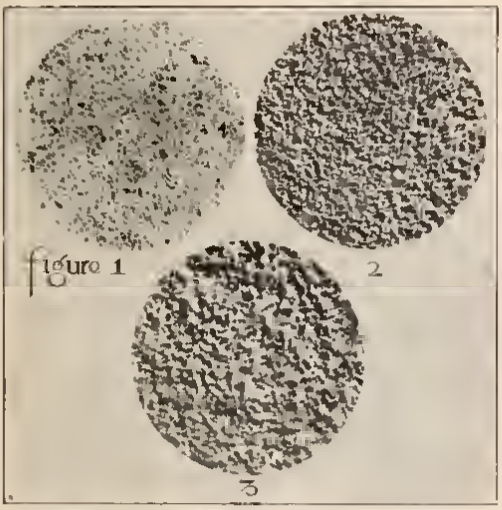
By J. I. CRABTREE *and* C. E. IVES

(Communication No 380 from the Eastman Kodak Research Laboratories)

When freshly developed or so-called "green" motion picture film is passed through a projector, there is a tendency for an incrustation to accumulate on the aperture plate or tension springs which retards the free passage of the film through the machine. Chemical analysis has shown that this incrustation consists largely of gelatin with more or less silver, dirt, and oil, but it contains usually only a trace of the metal or alloy of which the gate is composed.

The effect of the incrustation is to increase the friction between the metal parts of the gate and the gelatin coated surface of the film. This causes excessive strains on the edges of the perforations at the pull-down sprocket which ultimately results in torn perforations and therefore a diminished projection life of the film.

It is possible to reduce considerably the tendency for the formation of the gate incrustation by suitable lubrication of the film surface. This is accomplished usually by the application of a thin line of paraffin wax to the edge of the film which melts under the heat of the projector and forms an effective lubricant. However, the wax tends to wander over the picture area if applied



Photomicrographs showing appearance of surface of motion picture film by reflected light. Fig. 1—Clear area of film. Fig. 2—Area in region of silver image. Fig. 3—Silver image toned with iron ferrocyanide

in excess and particularly in the case of sound record films; this is very objectionable.

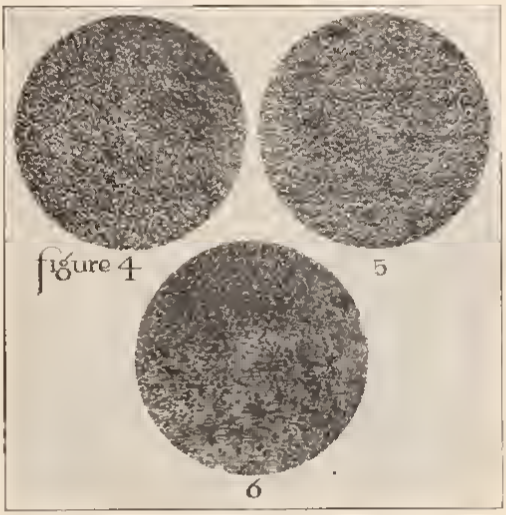
It is the object of this paper to discuss the various methods of lubrication employed to date and to indicate a new method which is equally satisfactory for sound record and ordinary motion picture films.

Factors Affecting the Ease of Passage of Motion Picture Film through a Projector

The facility with which the film passes under the pressure springs in the projector gate depends on:

1. The physical condition of the gelatin coating of the film.
2. The conditions to which the film is subjected in the projector.

1. If motion picture film is examined under a microscope by reflected light, it is seen that the gelatin surface, even in the region which is relatively free from silver, is covered with innumerable extrusions (see Fig. 1, magnification 540). The roughness of the surface is much greater in the vicinity of the silver image (see Fig. 2, magnification 790) and if the latter is toned with iron or uranium the roughness is still greater (see Fig. 3, magnification 790). This is as would be expected because the toning process intensifies the image by virtue of the



Photomicrographs showing effect of burnishing, and coating the film surface with wax and then burnishing. Fig. 4—Untreated film. Fig. 5—Burnished. Fig. 6—Waxed and burnished

deposition of iron or uranium ferrocyanide around the silver grains composing the image and thus enlarges them.

It is possible to smooth the film surface either by grinding away or burnishing down the minute projections or by filling up the crater-like depressions. The effect of burnishing and of filling up the depressions with wax and then burnishing or polishing is strikingly shown in Figs. 4, 5, and 6. Fig. 4 shows the surface of untreated film (magnification 540). Fig. 5 shows the same film after burnishing and Fig. 6 after applying wax and burnishing.

Fig. 7—Showing partial burnishing effect on film during projection

Tests have been shown that the act of burnishing or polishing the film surface without the application of a lubricant such as wax or oil does not appreciably facilitate the passage of the film through the projector gate. It is well known, however, that film which has been projected once or twice has a much less tendency to pro-

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News Man Saves Old Glory

A. S. C. Man Shooting the Chinese War Finds the Flag Desecrated When Shek's Men Sack Consulate at Nanking

By A. E. Lilius

[Mr. A. E. Lilius, Paramount News cameraman, and latest applicant for membership in the A. S. C., contributes the following interesting account of his recent adventures in China where he was on the firing line for his particular service. Mr. Lilius has just returned from China and will make his home in Hollywood.—Editor's Note.]

General Chiang Kai Shek had captured Nanking on March 23rd. A few Americans, British and Japanese were murdered and the world expected that justice would be meted out—news about intervention—a punitive expedition which would teach the Chinese how to behave—but nothing came out of the hoped for military expedition of the British and Americans, and, finally, the gasping world was astonished by the news that the good old U. S. A. was not going to do a thing or even take part in any unfriendly notes demanding satisfaction for the American lives that were lost in Nanking.

Mr. A. E. Lilius

The news was "first page news" and had to be covered. A cable from Paramount "News," for whom I covered the Chinese struggle, advised me about the desirability of going to Nanking to "shoot" Chiang Kai Shek and the American Consulate, which was supposed to have been looted; the Socony Hill where everything had been destroyed; and to record on the film the situation in general.

Now, I am an old war horse and know that personal safety is, under peculiar circumstances, purely a diplomatic accomplishment, so I secured all kinds of papers from the foreign office of the Nationalist Government in Shanghai, and also wired to Nanking personally to the General, Shek, asking for permission "to record in pictures the marvellous progress of the Nationalist movement under his captaincy." I received a favorable reply and was ready to go.

But I could not go without an interpreter. The times were rather too dangerous and one could never know what a situation one might fall into. I wanted a more or less educated man to go with me and I had seven candidates at various prices, but as soon as they found out that I wanted to go to Nanking each one found reasons to retire gracefully. One bird told me that he refused to go with me because I used to swear and was not Christian enough. That happened about two minutes before the train was to go and I had disclosed to him our destination. What I said to him then must have confirmed his former judgment.

I had to go back to the hotel and there I asked the room clerk to get me a "boy," a servant who understood English. The very next day he got me a sullen-faced chap who spoke a delightful pidgeon-English and I found later that he was a marvellous cook and did not care whether he was with the Nationalists or the Northerners and was ready to go anywhere I went, so, throughout the whole campaign he accompanied me both as servant and interpreter. But unfortunately the last train that went for weeks to Nanking was just the train I missed the previous day and there was only one thing to do—to go by steamer up the Yangtse Kiang River.

I went to the American authorities to get a translation of my passport, but when they found out where I was going they refused the translation and forbade me to go. They even pointed out that should I go and anything happened to me they were not responsible and no assistance could or should be expected.

I went anyway. It took us five days to reach Nanking, and we were escorted part of the way by an English gunboat, which obligingly answered every shot fired at us from both banks of the Yangtse. Once our steamer collided with a junk, just as I was ready to shoot some river scenery and, of course, I got the whole adventure from the very beginning to the end. I had the good fortune to stand ready on the bridge when I saw what was coming and I really believe this to be the first actual collision-picture—not ordered—shot from one of the colliding vessels.

Finally we arrived at Nanking. There was no communication with the shore. On the north bank of the river were the Northern troops, on the other were Chiang Kai Shek's army, both armies bombarding each other. Here were also a few Americans, British and Japanese destroyers stationed out of reach of the Chinese artillery and, under their protective guns, floated the small Standard Oil Co.'s motor-tank MEI-LU, whereto the American Consul after the massacre had fled. We got aboard the Mei-Lu.

Now, when a countryman meets another anywhere else in the world there is always a handclasp and a friendly greeting. We met the consul who eyed us auspiciously and we met the Standard Oil officials who did not eye us at all. The consul demanded my credentials and I showed him the passport and my cables and all the papers I had. I asked his permission to shoot his picture, etc., which was firmly refused. Finally I persuaded him to pose, but the Standard Oil officials refused stubbornly and, when politely requested to give me their initials for my reports, they frankly bade me to go to h—l. I asked the consul's permission to let my "boy" go elsewhere with his two Chinese secretaries who lived in Nanking, but he refused. Finally I got hold of a sampan, navigated by two old women, and the "boy" went away with word to the General that I had arrived and wanted protection if I was to go ashore. Unfortunately I had to stay overnight aboard the Mei-Lu and early the following morning the "boy" returned with the General's personal secretary who welcomed me and told me that a body-guard awaited us on the south bank. When I bade my host good-bye I was reminded that I should pay for the two meals I had, but that there was no charge for the deckspace I had occupied during the night. Well, I paid.

Nobody shot at us, I believe, while we rowed ashore, at least there was no hits and we landed. The general had sent an automobile and four soldiers armed to the teeth for our protection. Then we were whisked away to a native hotel and the secretary told us exactly what pictures we could take and what should not be taken.

But to shoot pictures of what the General wanted to have shot was not my idea of good news work, so I did my best to evade my bodyguard and I succeeded a few times, but finally I had to tell the secretary that what I came for was the picture of the American Consulate and, in pictures, show the world whether there

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Pan. Film and Globes

The Coming of Panchromatic Started Something That Cannot Be Stopped

CONTRIBUTED BY A MEMBER OF THE A. S. C.

The advent of Panchromatic film is being followed at the present time by the adoption of a system of lighting better adapted for bringing out the fine qualities of this film, together with economical and psychological considerations of prime importance.

In the October issue The American Cinematographer published a paper submitted by Mr. Peter Mole to the Society of Motion Picture Engineers at their fall convention, on incandescent lighting as adapted to motion pictures, and to the already quite imposing array of productions mentioned as "shot" partially or totally with incandescent lights may now be added "13 Washington Square," produced by Universal with Mr. John Stumar at the camera; "French Dressing," a First National picture photographed by Mr. Ernest Haller; "Louisiana," a Fitzmaurise production shot by Mr Lee Garmes; "The General," of Famous Players with Mr. Bert Glennon responsible for the photography

The reports on the results obtained by these companies are most enthusiastic, especially when commenting on "close-up" work.

The trueness of the final result, the much better rendering of the values of the settings and finally the total absence of strain upon the eyes of the players as compared with the glaring arc lights, make this method of lighting very popular among cinematographers, art directors and actors, and proves conclusively that incandescent lighting is accepted and welcomed in motion picture productions.

The American Society of Cinematographers is at work in collaboration with several electrical manufacturers who can foresee the near universal adoption of this system of lighting, in order to increase the already proven efficiency of the equipment already in use and to design and adopt other equipment so as to be in a position to solve all problems that may arise during production.

The Research Committee of the A. S. C. has been for the last few months experimenting extensively in a practical and theoretical way, and gathering important data from all competent sources. The line of investigation conducted by the Research Committee extends naturally to all factors that enter into the success of incandescent lighting, and is especially centered on the sensitive emulsions and the photographic lenses.

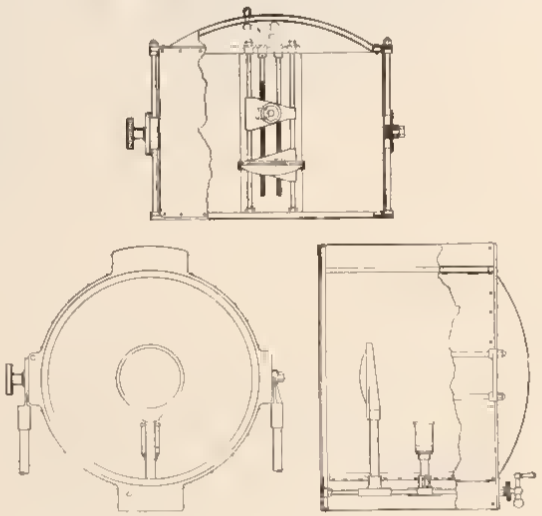
The community of efforts thus inaugurated by the A. S. C. is bringing about remarkable results, and although the committee is not yet quite ready to report in full upon the results of its labors, this announcement will not suffer great delay and will doubtless add important evidence to that already adduced in favor of the supremacy of incandescent lighting over the old exclusive arc-light system.

Besides the question of RESULTS, which is paramount in production of motion pictures, the economic question has been carefully analyzed and the conclusions reached point out clearly that the new system deserves in every respect, not only all the encouragement that it can receive, but also warrants expenditures of money and time to bring to a point of perfection equipment of all sorts that will be necessary for rendering this innovation a truly accomplished fact.

The Mole-Richardson Co., of Hollywood, pioneers in the manufacture of incandescent lights for use in motion picture studios, have put on the market, in addition to the broadside units, an 18-inch incandescent spotlight, a diagram of which is hereby reproduced.

The spotlight is usually equipped with a 3000 Watts Tungsten bulb. The diameter of the parabolic mirror is 18 inches and a 6-inch condenser is set in front of the bulb to equalize the surface illuminated.

The rays reflected by the mirror would be interfered with by the bulb itself and all the rays emitted by the bulb's filament from the portion facing the object to illuminate, would be scattered were it not for the condenser, whose power has been carefully estimated and whose adjustability permits a perfect balancing of the



intensity of the luminous rays. This precludes any waste of light energy and destroys the "ghost" visible when the condenser is not in use.

The intensity of illumination of the spotlight with a 3000 Watts bulb, and when it is used in conjunction with incandescent broadsides, may be compared, as per balance of intensity, to a 120 Amps. or an 80 Amps. rotary arc spot, used in connection with arc broadsires.

On a walnut background set, furnished with somber living room furnishings, and actors without make-up of any sort and dividing the lights in over-head and front lightings he obtained fully exposed negatives, using approximately 45000 Watts for a background area of 225 square feet with an F.3.5 lens and a 170 degree shutter.

This figure is given as documentary information to be considered as a maximum of lighting required under the trying conditions explained above.

Besides the technical and economic advantages that the incandescent lights present, another important element must be taken into consideration. The writer has interviewed several actors and actresses, stars and featured players, on their impressions as in the matter and unanimously the new system has been acclaimed as restful, less disturbing, in other words, more intimate than the exclusive arc-lights system.

And this is of great importance indeed.

Right at the moment a player is to give vent to the emotional sentiments with which he has imbued himself through deep concentration; right at a moment in which he is divesting himself of his own personality to become the living counterpart of the character he is portraying,

(Continued on Page 16)

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FIRST CINEMATOGRAPHERS

Adams, William S.—
Allen, Paul H.—
Anderson, Melford A.—
Andriot, Lucien—De Mille
Ash, Jerome H.—
August, Joe—Fox.
Abel, David—De Mille.
Arnold, John—M.-G.-M.

Badaracco, Jake—
Barlatier, Andre—
Bergquist, Rudolph—
Boyle, Chas. P.—De Mille.
Boyle, John W.—Sennett.
Bryce, St. Elmo—Sennett.
Bridenbecker, Milton—Universal.
Brown—Jas. S., Jr.—F. B. O.
Benoit, Georges—
Barnes, George S.—Goldwyn.
Brotherton, Joseph—
Broening, H. Lyman—
Beckway, Wm. J.—

Carter, Claude C.—Australia.
Cline, Robt. E.—Scholck Studio.
Cline, Wilfried—Universal.
Crockar, Geo. D.—
Cronjager, Edward—Lasky.
Cronjager, Henry—
Clark, Daniel B.—Tom Mix, Fox.
Cooper, Harry H.—
Catner, Frank M.—
Clarke, Chas. G.—Fox.
Cawling, H. T.—Eastman Kodak Co., Rochester, N. Y.
Crockett, E. J.—

Davis, Chas. J.—Warner-Vitaphone, N. Y.
Draper, Lauren—Sierra Pictures.
Daniels, Wm. H.—M.-G.-M.
Davey, Allen M.—
Davis, Harry—Fine Arts.
De Vinna, Clyde—M.-G.-M.
DeGrasse, Robert—F. B. O.
Diamond, James—Metropolitan.
Doran, Robt. V.—
Dored, John—Paramount News, Riga Latvia.
Dubray, Jos. A.—
Du Par, E. B.—Warners.
Du Pont, Max—
Dean, Faxon M.—

Eagler, Paul E.—M.-G.-M.
Eldredge, F. R.—Universal.
Eshek, Le Roy—F. B. O.
Evans, Perry—
Edeson, Arthur—First National.
Fabian, Max—M.-G.-M.
Forbes, Harry W.—Stern Film Corporation.
Folsey, George Jr.
Fryer, Richard—
Fildew, William—
Fischbeck, H. A.—Lasky.
Fisher, Rosa G.—First National.
Gerrard, Henry William—Lasky.
Gheller, Edward—
Gerstad, Merritt B.—M.-G.-M.
Gobbett, David William—
Gosden, Alfred G.—
Gilks, Alfred—Lasky.
Gray, King D.—
Guissart, Rene—Paris, France.
Good, Frank B.—Fox Studio.
Griffin, Walter L.—David Hartford Productions.
Gaudio, Gaetano—Douglas Fairbanks-United Artists.
Hallenberger, Harry—Lasky.
Harris, Emil—Universal
Heisler, Frank B.—
Hilburn, Percy—M.-G.-M.
Hunt, Roy—Lasky.
Hyer, William C.—Educational.
Horne, Phhny—
Haller, Ernest—Robt. Kane Productions Hollywood.
Heimerl, Alois—
Jones, Allen C.—Universal.
June, Ray—Fine Arts Studio.
Jackman, Floyd—Warner Bros.
Jackman, Fred W.—Technical Director, Warner Bros.
Jackson, H. A.—Corinne Griffin, U. A.
Jennings, J. D.—Buster Keaton.
Kershner, Glen—Metropolitan Studios.
Kesson, Dave—United Artists.
Kesson, Frank A.—
Kirkpatrick, H. J.—Universal.
Klaffki, Roy H.—
Kornmann, Antbony—Universal.
Kull, Jacob—Universal.
Koenekamp, H. F.—
Kurrle, Robt. E.—First National.
Linden, Eddie—Universal.
Lloyd, Art—Hal Roach.
Longenecker, Bert—
Lyons, Chester—Fox
Lyons, Edgar—Christie.
Lyons, Reginald—Fox
Lundin, Walter—Harold Lloyd, Metropolitan.
Lockwood, J. R.—
Marley, J. Peverel—De Mille.
Mackenzie, Jack—Douglas McLean, Lasky.
Marsh, Oliver—M.-G.-M.
Marshall, Wm. C.—Lasky.
Martin, H. Kinley, Lasky.
Mescall, John J.—M.-G.-M.
Miller, Arthur—De Mille.
Miller, Ernest W.—Chadwick Studio.
Miller, Virgil E.—Universal.
Mohr, Hal—Warners.
McClung, Hugh G.—Douglas Fairbanks, U. A.
McCord, T. D.—First National
McDonnell, Claude—London, England
McGill, Barnay.
MacWilliams, Glen—Fox.
Meehan, Geo.—Fox.
Morgan, Ira H.—James Cruse, Metropolitan
Musuraca, N.—F. B. O.
Milner, Victor—Lasky.
Murray, James V.—Lasky.
McManigal, E. L.—
Newhard, Robt.—
Neumann, Harry C.—Universal.
Norton, Stephen S.—
Oswald, H. M.—

O'Connell, L. Wm.—Fox
Powers, Len—Hal Roach
Perry, Paul P.—
Perry, Harry—United Artists
Palmer, Ernest—Fox
Polito, Sol—First National
Reeves, Arthur—
Reynolds, Ben F.—
Ries, Irving G.—M.-G.-M.
Robinson, Geo. H.—Universal
Rosson, Hal—
Roos, Len H.—c/o Pathe Review, Singapore, S. S.
Rose, Jackson, J.—Universal
Rosher, Chas.—Mary Pickford-U. A.
Ries, Park J.—
Scheurich, Victor—
Schoenbaum, Chas.—Lasky.
Scholtz, Abe—
Shamroy, Leon—Fine Arts Studio
Smith, Ernest F.—
Smith, Harold G.—
Smith, Leonard—Educational
Stengler, Mack—F. B. O.
Stevens, Geo.—Hal Roach.
Stevens, Jack—Richard Talmadge, Universal
Struss, Karl—United Artists-D. W. Griffith
Stumar, John—Universal
Stumar, Chas.—Universal.
Sharp, Henry—M.-G.-M.
Smith, W. S., Jr.—
Schneiderman, Geo.—Fox
Scott, Homer A.
Seitz, John F.—M.-G.-M.
Snyder, Edward J.—Pathe-Fine Arts
Thompson, W. C.
Tannura, Philip—F. B. O.
Tetzlaff, Ted—Chadwick.
Tover, Leo—United Artists.
Todd, Arthur L.—Universal
Turner, J. Robert—Educational.
Tuers, Billy—
Tolhurst, Louis H.—Microscopic Pictures, Pathe
Valentine, J. A.—Fox Studio.
Van Enger, Charles J.—
Van Trees, Jas. C.—First National.
Van Buren, Ned—Eastman Kodak, Hollywood
Vogel, Paul E.—
Wagner, Blake—
Wagner, Sidney C.—Fox.
Walker, Earle F.—
Walker, Joseph—Columbia.
Walker, Vernon L.—Sennett
Warren, Dwight W.—
Whalen, John P.—Santa Fe Studios (Monrovia)
Wheeler, Wm.—Christie Studio.
White, Ben—Fox
Williams, Wm. N.—Sennett.
Widen, Carl—Tiffany.
Wrigley, Dewey—Metropolitan.
Wyckoff, Alvin—
Wells, Conrad—Warners Vitaphone Prods.
Wenstrom, Harold—
Whitman, Philip H.—Directing Sennett Studio.
Wilky, L. Guy—
Warrenton, Gilbert—Universal.
Young, Jack R.—M.-G.-M.
Zucker, Frank C.—Harold Lloyd Unit, New York.

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Edouart, Farciot—Lasky.
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Smith, Arthur—Lasky.
Smith, Jack—Fox.

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Bennett, Guy M.—
Blackstone, Cliff—Lasky.
De Vol, Norman—Fox.
Dyer, Elmer G.—Universal
Fetters, C. Curtis—Fox.
Galezio, Leonard T.—
Greiner, A. Leroy—First National
Hickson, John T.—
Hoke, Ira B.—
Larabee, Nelson—Warner Bros.
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Fryer, Elmer—De Mille
Kahle, Alexander—De Mille
Mannatt, Clifford—M.-G.-M.
Parker, Robt. M.—E. R. L. Studios
Richee, Eugene Robert—Lasky.
Rowley, Les—Lasky.
Sigurdson, Oliver—Metropolitan Studio
Thomas, Wm. E.—De Mille
Van Rossem, Walter J.—James Cruze, Inc., Met. Studio

SECOND CINEMATOGRAPHERS

Bader, Walter S.—M.-G.-M.
Bauder, Steve L.—M.-G.-M.
Baxter, George—De Mille.
Bennett, Monroe—
Borradaile, O. H.—Lasky.
Chaney, George—United Artists
Chewning, Wallace D.—M.-G.-M.
Cunliffe, Donald—Universal.
Davis, Leland E.—
Doolittle, Jas. N.—First National.
Drought, Jas. B.—Universal.
Dunn, Linwood G.—Metropolitan Studios
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Jenkins, John—
Julian, Mac—
Keyes, Donald B.—
Landrigan, John S.—Lasky
Lang, Charles Bryant—Lasky
Longet, Gaston—F. B. O.
Lanning, Reggie—Lasky.
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Laszlo, Ernest—
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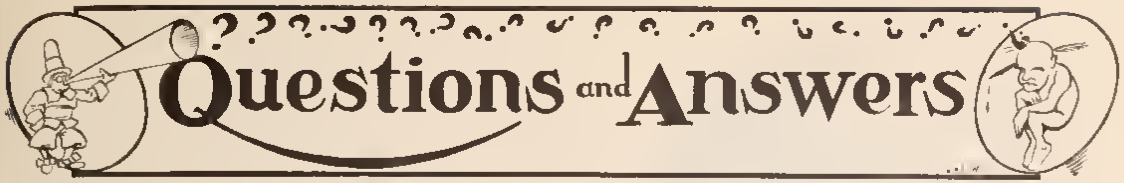
Unholtz, George—Sennett
Van Dyke, Herbert—M.-G.-M.
Van Enger, Willard—Warner Bros. Vitaphone.
Wagner, Robt.—First National.
Walters, Joseph J.—F. B. O.
Westerberg, Fred—De Mille.
Wilde, Harry—
Williams, Alfred E.—Lasky.
Williams, Frank D.—Special Process
Rex, Wimpy—Lasky
Witzel, E. L.—Universal.



[The Question and Answer Department of The American Cinematographer is not reserved for professional cinematographers, but is open to anyone who may have any inquiry to make appertaining to cinematography or to photographic subjects in general. The questions are answered by experts and the information published is as near 100 per cent correct as our archives and wide experience yield.—EDITOR'S NOTE.]

QUESTION—Why is a cameraman always represented in cartoons as wearing a cap backwards?

ANSWER—Most of the Motion Picture cameras in use by professional cameramen are equipped with a powerful magnifier for critically focusing on the ground glass. The design of the magnifier is such that the eye has to be very close to it when being put to use. Exigencies of construction of the camera require this magnifier to be very close to the general frame of the instrument. The visor of a cap or the brim of a hat interferes with the necessity of bringing the eye to the required nearness of the magnifier, hence the habit of getting the interference out of the way, by turning the cap around in the peculiar position which has struck the attention of cartoonists and provoked your question.

* * *

QUESTION—When is it best to use a filter?

ANSWER—It is very simple to ask such a question, but the answer would take a whole volume. As photographic emulsions are over sensitive to the blue—violet—and infra violet rays, a yellow filter is used when this excess of illumination and color value would be detrimental to the desired results. The use of Panchromatic and orthochromatic materials warrants the use of a filter on all occasions, while with normal emulsions a light yellow filter may be found useful whenever a large expanse of sky and water form the subject (at the sea shore, for instance). Filters are also used when it is desired to obtain a distortion of the relative value of a color sensation, when, for instance, it is desired to produce a night effect by obtaining a dark sky in a picture taken in day time. The American Cinematographer will treat on the subject in the near future.

* * *

QUESTION—What is an "aerial focus?"

ANSWER—A photographic objective forms an image of a given object in a focal plane conjugate to the plane of the object. This image may be collected on a screen such as a ground-glass and thus be rendered visible to the naked eye, or may be viewed through the use of a suitable optical combination such as a magnifier. An image inspected under such conditions is called an aerial image and can be focused (hence the expression aerial focus) when proper precautions are taken to avoid errors due to the power of accommodation of the eye.

* * *

QUESTION—Is the cameraman or the director responsible for the artistic effects in a Motion Picture?

ANSWER—The cinematographer is fully responsible for the photographic effects in a Motion Picture production. Selection of settings is made by the cameraman in collaboration with the director, according to the requirements of the production. Interior settings are designed and finished by art-directors and decorators, and the cameraman is responsible for the artistic composition and lightings of the numerous scenes photographed in the setting, which is always photographed under a great variety of angles.

* * *

QUESTION—Is it possible to edit and cut a film in its developed negative state, or is it only advisable to perform this operation on the positive? Which method is the correct one?

ANSWER—The advisable method is as follows:

I—Trim from the negative all footage which is absolutely unnecessary to the finished picture, as, for instance, the few frames or feet always taken at the beginning and end of each scene which are not essential to the scene itself.

II—Cut and edit the positive printed from the trimmed negative. This operation to be done by progressive steps, viewing the film, constantly eliminating or shortening scenes, or re-adding scenes or portions of scenes eliminated by first judgment.

III—If more than one print is desired, cut the negative by matching the scenes that your judgment have considered indispensable to your picture. This to avoid unnecessary expenditure in the printing and time in editing every print.

* * *

QUESTION——Is an extra charge made for developing and printing Panchromatic films in the laboratories?

ANSWER—A moderate extra charge is made for developing Panchromatic negative, but no extra charge is made for the printing, this process being the same for both Panchromatic and regular negatives.

* * *

QUESTION—What is the charge per foot for the best professional developing of (a) the negative, (b) the positive and (c) the printing?

ANSWER—This department cannot quote any prices for any photographic manipulation done in laboratories or elsewhere, this being beyond its sphere of action. If you communicate directly with laboratories you will obtain the information you request.

* * *

QUESTION—Is the original negative the "master?" Are all the final positives printed from this same negative?

ANSWER—Yes.

* * *

QUESTION—In every instance are two negatives exposed (one for foreign and one for domestic release)?

ANSWER—Whenever a foreign release is sought or secured, it is customary to expose two negatives. This mostly in order to be in position to release the picture in foreign countries without being in the necessity of waiting for this release until all prints for domestic release are made. This is the case in practically all motion picture productions made for exploitation.

* * *

QUESTION—I have a De Vry portable camera and wish to know how I can adapt filters for Panchromatic work to it?

ANSWER—A glass filter may be adapted in front of the lens by using proper filter mount. More advisable is the use of gelatine filters, which can be inserted between the lens and the film. The filter may be held securely in place by constructing a metallic cylindrical holder which can be inserted in the cylindrical projection of the De Vry camera, which holds the bayonet mount of the lens.

* * *

QUESTION—Who is considered the best cameraman in Motion Pictures?

ANSWER—It would be very unethical for this department to express a judgment in this question, the answer pertains to the public in general. It is, in our estimation, impossible to decide upon the very best cinematographer, but we can say that the very best (plurally speaking) are found among the A. S. C.'s.

S. M. P. E. Transactions

(Continued from Page 7)

used for industrial lighting. Had they operated the lamps at over-voltage as in the Kodak studio, the total number of lamps would be reduced about 30% using the same type of lamps and fixtures.

Recently, we received an order for lamps from a studio on the Coast asking for 2000 and 2500 watt lamps. The particular types described on the order are designed for high intensity spot lighting. They will give an averlife of 50 hours each, and it will be our job to change the order to something more reasonable for studio lighting. Tomorrow we may have another order from another studi fr lamps just as porly suited for their work. The efect photographically is excellent, but the cost is excessive and the chance are they will over-volt them. You sboul dnot over-volt a lamp desigend for the extreme intensity of the 50-hour lamp, and yet I am quite sure that unless steps are taken now in advance, and Mr. Farham and others could save a good deal of money in this way.

I think Mr Farnham should tell the members about the heat of Mazda lamps on which he has had direct experience.

MR. FARNHAM: In my work in the various studios on the use of incandescent lamps the question of heat from these lamps has never been raised. I have made inquiry on this point from the actors and other people employed on the sets, and the usual reply was that they had not noticed any particular difference. The incandescent lamp equipment does not require ballast resistances which dissipate a considerable quantity of heat, and hence, causes an increase of temperature in the vicinity of the set. The decrease in make-up required when incandescent lamps are employed unquestionablly accounts for the greater comfort of the actors when working on sets lighted by incandescent lamps.

MR. ROSS: Do not the fast lenses now generally employed assist materially in reducing the illumination required?

MR. FARNHAM: Yes. Heretofore, the standard lens has been the f/3.5 and the studios are now using f/2.3 or f/1.8 or 1.9, and one is experimenting with f/1.5 with very satisfactory results.

Pan. Film and Globes

(Continued from Page 11)

a sudden unnatural glare of lights is actually blazed into his face, accompanied most of the time by hissing, sputtering, sizzling, smoking and what-not, which throws an enormous task upon the nervous system of the player and very often leaves him disconcerted. We have often wondered at the great self-control actors must possess and at the energy that must be wasted to keep such control.

One could keep on writing "ad infinitum" on this subject, the moral and material effects, the cleanliness of it, the lighter physical burden imposed upon all and many other phases of the system that IS with us to stay.

The A. S. C. and each cinematographer individually is taking into consideration all of the advantages presented by the incandescent system of lighting and can promise greater achievements, which means greater service to the public we serve.

The Cinema Triangle

(Continued from Page 4)

from beneath suggestive of infernal fires, feeding the imagination, and breathing that into the picture that makes the observer feel as well as see the story. In the ball room we look for brilliant overhead or "face-level" lightings, suggesting cheerfulness and freedom from the shady things of life. Again, we know that flat lighting (from the front) lends distance to our exteriors, and cheapness to interiors; whereas "back-lighting" (light towards the lens) tends to foreshorten, i. e., to bring the scene closer to us, as well as to enrich interior settings, and a judicious mingling of these two lightings gives us the beautiful "modelings" so much sought for, and which we so much admire on the screen.

Speaking of the camera's untruthfulness, we know that it is an honorary member of the Ananias Club, and as such proves of great value to the writer. As the magic carpet of old transported its owner at once to any country, the camera of today, through the medium of the screen, will transport a Los Angeles Circus parade to an Indian Durbar or set a Hollywood mob in front of Buckingham Palace, unknown to the participants until they see it at their local theatre.

Should the scenario call for an old castle, it is not necessary to send a director and his troupe to Germany or Spain; its exact counterpart can be built in Hollywood, and not even the Hollywood-ite will know of its existence, because it will be built in miniature, yet which it appears on the screen, the audience will see a real castle, with its peopled drawbridge, its moat, and all action called for by the script. Another story calls for a storm at sea, with the collision of two ships; one sinks and the other becomes helpless! lightning adds its terrors; the audience sits and gasps, their bodies tense with the action that thrills them. A few years ago such a scene would have been impossible; today it can be done on any studio lot The Pyramids of Egypt can be set on the San Pedro hills; the bay of Naples can be set in a crescent below Hollywood, Mount Hollywood turned into a Vesuvius, and the audience will believe they are seeing an Italian wonder-scene. It would be a wonder scene, but not Italian. These things are possible because the camera does lie. But in lying it speaks a great truth. After all, the camera is only a thing of metal, a dead thing until touched by a Midas of Thought. Guided by the cameraman's knowledge of its functionings it performs the miracle of motion photography that transforms the writer's abstract thought into concrete images, that he who sees may understand.

It is such knowledge as this that the writer must have or be able to obtain to enable him to further his story values and give his audiences cause to wish for more of his work. If the cameraman can, with his lightings, illusions, "fakes," etc., enable the writer to create a demand for his stories, he welds together the triangular producing organization by bettering good stories and giving to the director a script that makes his work a pleasure and insures a tri-mutual co-operation that makes for beter pictures.

Amateur Cinematography

(Continued from Page 8)

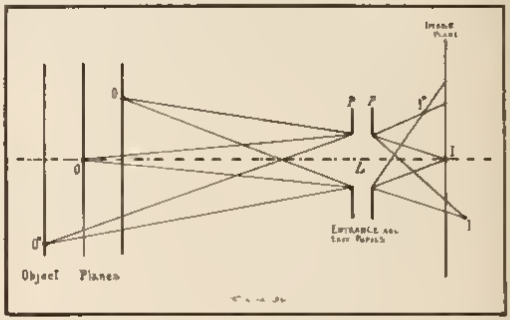
the lenses under the same angle and at corresponding points as indicated in the figure, and consequently the emergent ray will be parallel to the incident one Their prolongations will meet the axis at the center of the entrance and exit pupils P and P' in the Fig. and therefore determine the position of the pupils.

Moreover let us consider a ray R which, in its path between the components of the objective, grazes the edge of the diaphragm. In such case the emergent ray is not parallel to the incident one, but the prolongation

of incident and emergent rays are directed to corresponding points on the edges of the pupils and thus determine their amplitude.

When the components of the objective are not symmetrical the size and position of the pupils vary in regard to the diaphragm, but their size and position can be varied by altering the position of the stop in respect to the components of the objective.

If we consider now a solid object, that is to say, an object occupying the three dimensions of space, width, breadth and depth as indicated in Fig. 32, we find that the existence of the entrance and exit pupils admits through the objective, a **cone** of rays pertaining to each single point of the object.



Suppose O, O′ and O″ to be three object-points pertaining to the same object at different distances from the objective L. The result is evident that if the point O is brought to a focus on the image plane I, the points O′ and O″ will be refracted upon I as discs of confusion, whose dimensions are determined by the size of the entrance and exit pupils P and P′.

As a consequence images formed by an objective of finite aperture can be **absolutely sharp**, only in one plane, corresponding to its conjugate plane in the object space. All other planes closer or farther from this object plane will then be less sharp, the more distant they are from the plane brought to the perfect focus. This inability of an objective to bring all points of a deep object in focus would be very disturbing, were it not for the impossibility of the human eye to distinguish any such imperfection within certain limits.

It has been explained in another chapter that the eye cannot distinguish separately two points subtended in an angle whose aperture is approximately one minute or 1/60 of a degree. Whenever the disc of confusion does not exceed this measurement the image appears perfectly sharp; in reality even a much greater amplitude of the disc of confusion can be used as limiting point of sharpness before the indistinctness of the image becomes disturbing.

It is quite evident that the smaller the size of the pupils hence of the diaphragm, the more tapered are the cones of rays admitted to form the image and therefore the smaller are the discs of confusion for any given point of the image space. Thus the smaller the diaphragm the more of the object planes are brought into sufficient sharpness and the more the objective is said to have Depth of Focus.

If we do not take into consideration any of the aberrations of the objective and we consider them as perfectly corrected, the **depth of focus** due to the aperture is absolutely independent of quality of glasses, number of elements and general design of the objective and stands equal for all makes of photographic lenses.

(To be continued Next Month)

Lubrication of M. P. Film

(Continued from Page 9)

duce an incrustation on the gate than "green" film and this is usually attributed to the burnishing or polishing action of the aperture plate or pressure springs on the gelatin coating of the film. The burnishing effect produced by projecting the film in a Simplex projector ten times is very slight as shown in Fig. 7 (magnification 540). This is a photomicrograph of the film surface in the region between the perforations. The lower half of the figure shows a portion of the film surface which was in contact with the aperture plate. The burnishing effect on the film surface is negligible.

It is considered that traces of oil which are transferred to the film surface during the first projection are chiefly responsible for the increased ease of passage of the film on subsequent projection.

It is obvious also that the moisture content and degree of hardening of the gelatin coating are important factors which determine the rate of formation of the incrustation in the gate. If the gelatin coating of the film contains an excess of moisture, it tends to soften and become "tacky" much more readily in the hot projector gate than is the case with dry film. This tendency of the gelatin coating to soften under the action of heat can be diminished by hardening during processing. However, excessive hardening tends to increase the brittleness of the film and is not to be recommended.

2. Apart from the condition of the film, the following factors relating to the conditions existing in the projector also determine the extent of the formation of the gate incrustation.

(A) The tension of the gate springs. This should be of the order of eight ounces for each spring or a total of sixteen ounces. The spring tensions should be adjusted individually at intervals by attaching a spring balance to the upper end of a narrow film strip placed at one side of the gate and increasing or decreasing the gate tension until the film just commences to travel upwards when the spring balance registers eight ounces with an upward pull.

In a like manner the tension with full width film should be adjusted to sixteen ounces.

(B) The nature and smoothness of the gate surfaces. The nature of the gate material in contact with the film surface, providing it is of sufficient hardness, is of less importance than its degree of smoothness. Satisfactory materials are cast iron or stainless steel, either plain or chromium plated. Corrosion should be carefully guarded against and any gelatin incrustation removed with a wood or bone scraper so as not to scratch the polished surface.

(C) The temperature existing at the gate. As explained above, the tendency of the gelatin to incrust on the gate springs in the case of freshly processed film increases with temperature. Any means of reducing gate temperature such as the use of heat absorbing glass, a blast of air impinging on the gate, or suitable radiating fins on the gate, is desirable.

Methods of Facilitating the Passage of Motion Picture Film through the Projector

Even though a projector is in good mechanical condition and the above requirements are fulfilled, there is invariably a tendency for a gate incrustation to form with "green" film. Numerous methods of treating the film to effect this have been suggested from time to time as follows.

1. By Edge Burnishing the Gelatin Surface. It was considered that if the burnishing effect of the gate springs on the gelatin coating of the film could be simulated by a preliminary treatment, the difficulty caused by incrustation might be diminished. Accordingly, a machine was constructed for burnishing the edges of the film (see Fig. 8) consisting of a highly polished undercut roller (R1) working against the edges of the film and revolving in contact with and above an idler roller (R2). The film was fed between rollers R1 and R2 by means of a gearing so arranged that the film advanced

Fig 8—Film burnishing machine

through a distance of 1/80th the circumference of the roller R1 for every revolution of the latter. It was possible to adjust the pressure on the burnishing roller by means of adjustable screws.

With undeveloped film an appreciable degree of burnishing was observed to take place but with film fixed in a hardening bath the effect was very slight. Moreover, in view of the slight buckling of the film around the perforations, it was necessary to exert considerable pressure on the burnishing roller in order to flatten out the film so as to insure perfect contact. As a result of this pressure, a considerable amount of heat was developed, so much so that after the passage of a few feet of film, the gelatin coating commenced to grind away and particles of gelatin accumulated on the burnishing roller, stopping the machine. In order to prevent this it was necessary to apply a thin film of grease or oil to the burnishing roller which reduced the friction and prevented the grinding away of the gelatin.

In order to determine the precise effect of the burnishing as apart from the effect of the grease, a roll of film burnished with the aid of automobile grease was passed through the projector and a similar roll was merely treated along the edges with the grease. Since no difference was observed between the projection life of the two films, it was concluded that a mere application of oil or grease was just as effective as burnishing.

Experiments were made also with a heat burnisher consisting of a highly burnished heated roller working above a second roller and between which the film was passed with the gelatin surface in contact with the burnished metal. If the roller was heated to a temperature at which a drop of water sizzled on the metal, a satisfactory degree of burnishing was effected although this treatment did not materially prolong the life of the film on projection.

2. By Edge Lubrication. (a) Before the advent of more refined machinery for the purpose, it was customary to apply a layer of wax to the edge of the film during rewinding by passing the film face downwards over the blocks or candles of hard wax separated by a distance equal to the width of a picture frame. Although effective from a lubrication standpoint, with such an apparatus it is difficult to control the quantity of wax applied because this depends on the temperature of the wax, the pressure applied, and the rate of travel of the film. Usually the tendency is to apply too much wax which then encroaches on the picture area and causes dark spots or patches on the screen. An excess of wax is also apt to cause projector trouble as explained below.

(b) A suitable machine for applying a thin line of wax along each edge of the film surface and between

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Does The Camera Lie?

Mr. Louis W. Physioc Demonstrates How It May Become The Biggest Liar in All the World

By Louis W. Physioc

The accompanying pictures are a series of photographs of the head of the celebrated "Venus de Milo." They were designed to illustrate how different lightings may change the character of the subject; destroy or preserve beauty, exaggerate or subdue blemishes, aggravate or favor the signs of age.

This would seem a matter of supreme importance, especially to our feminine stars, for the question becomes more serious as the years roll by. It becomes almost tragic when they have reached that glorious age which combines the fullness of womanhood, maturity of character, compelling personality and dramatic experience, all of which combine to make them great artistes, when they find all this pitted against the smooth, youthful faces of the ingenues.

Louis W. Physioc

These wonderful women are continually taunted by that old bugaboo of a phrase "the camera never lies," and it is in their interest that we will endeavor to show that the camera may become the greatest liar in the world.

For many years some of our stars have been under the delusion that their best appearance on the screen was dependent upon an excess of flat light. How often have we heard the expression among the cameramen: "I have to burn her up."

Let us study the subject carefully and see what we can learn for the benefit of our stars. There is an impression among many of them that any degree of modeling or shading produces a muddy, dirty face on the screen and discloses age. This is an erroneous idea—it is muddy high lights that give the dirty appearance. Character lines and signs of age can be beautifully smoothed out by soft shading; it is the cast shadows from strong, direct light that does the damage. In the proper place we will distinguish between the shade and shadow. There is an axiom that we cannot assail, and it is this: Picture making depends upon light and shade, but we know also, that the best results demand a proper distribution of these elements, light and shade. There is no beauty in a white, flat surface outlined against a background. The elements of beauty in a face are nature's mould of the features, general coloring, the expression of the intelligent features, the eyes and mouth, which are so much influenced by the development of character, the evidence of temperament and personality and above all, the soul that shines through all—and these marvelous elements can just as easily be burnt up as the purely physical imperfections in the skin texture. How can we hope to find the soul of a beautiful woman in a pair of "klieg eyes"—the lure of dainty lips lost in a flood of flat light? The portrait of our goddess is usually represented in a pair of squinting, bloodshot orbs, two black spots marking the nostrils and a dash of rouge for delicately modeled lips. Must we call this feminine beauty?

Now there must be some simple rule that we may deduce from our study of this subject—some broad, fundamental fact that we may easily keep in mind, and we suggest a natural law that artists in all ages have recognized—it is this simple certainty that **the stronger the light the harsher the shadows and the harsher the shadows the more prominent the imperfections,** whether these imperfections be faulty mould of the features, a mole, wrinkles, pimples or other excrescences of the skin.

The recognition of this rule, then, naturally leads to a more detailed application to insure the most artistic results. The critical study, over a period of many years, has resulted in a general agreement among artists that these harsher effects of strong light and shade are sometimes suitable for rendering dramatic and spectacular ideas but that the more delicate forms of beauty should be lighted with more softness and plasticity. This last idea of lighting is not an easy thing to accomplish. It requires skill in the placing of the lights, a thorough knowledge of the quality of this light and a very refined taste and judgment as to the intensity of the lights and the depth of the shadows. The general illumination should be sufficiently soft to permit freedom of expression in the eyes but brilliant enough to avoid muddy lights; so highly diffused as to produce no cast shadows and so arranged as to furnish the proper modeling, upon which the reproduction of beauty absolutely depends.

In lighting a head we have five well defined elements, and it is the arrangement of these that demonstrates the talent of the photographer. They are Lights, High Lights, Shade, Shadow and Reflects. First, let us distinguish between shade and shadow. Common definitions do not furnish a satisfactory distinction between these two terms, but to the artists and photographers there is a wide discrimination. The artist defines shadow as the result of an opaque body intercepting the passage of direct light, leaving a dark contour of the object on the surrounding planes. This shadow is composed of two densities—the penumbra, that portion of the shadow that lies near the edge of the shadow and which is slightly illuminated by rays diffracted around the edge of the body casting the shadow; and the umbra, that portion not reached by any of the diffracted rays and left in total obscurity. This umbra controls the contrast of a picture and, as before mentioned, is directly proportionate to the intensity of the light. The modification of this umbra, by reflection, is important.

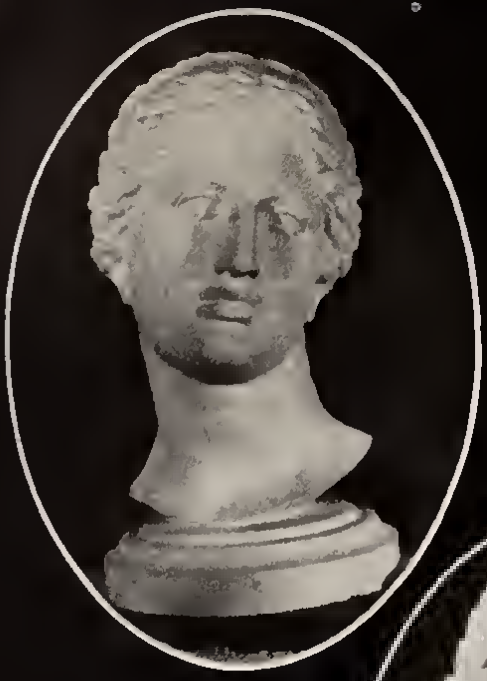
The shades are those portions of the subject unilluminated, and like the shadows, may be modified by reflects.

The lights of a picture are those areas subjected to light and are, in turn, modified by High-lights—points of light of greater intensity than the general lighting, thrown on the protuberating features to produce relief.

From all this we deduce another principle; artistic results depend upon the proper quality of light and its skillful arrangement. Now in selecting the quality of our light we must revert to our primary consideration, the fact that harsh shadows are unfavorable to the reproduction of the face, and that the only light that does not cast shadows is that which is highly diffused. Here we are confronted with a grave difficulty. For many years, the good old North light has been considered the ideal source, but modern expedients have forced us to desert this form of light.

The multiple bank of Cooper-Hewitts furnish a finely diffused light but have been mostly discarded because of their unwieldly mountings, and with the use of the present panchromatic stock they are useless, due to their spectroscopic limitations. That which is left to us, then, among the artificial lights, is the incandescent, now being experimented with, and the arc—and we find that they are both subject to the same important problem of sufficient diffusion without too much loss of light.

(Continued on Page 24)



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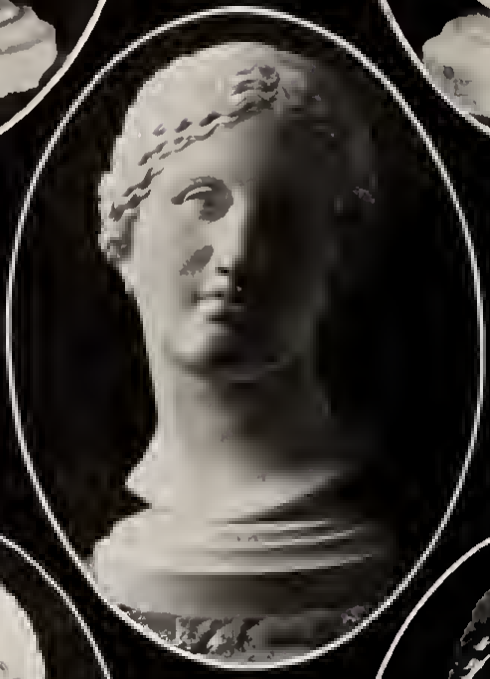

1

3

A

5


2
4
1
3
B
5

Does The Camera Lie?

(Continued from Page 21)

This difficulty lies in the fact that no matter how much we silk them down (cover them with mediums) there is always that active point of energy that casts the baneful shadow. With the aid of modern lenses and panchromatic film we are looking forward to the time when some one will be bold enough to make some experiments with matt surface reflectors as the basic source of light, especially for close-up work, in lieu of direct lighting. Surely we have been given sufficient hints of the value of indirect lighting.

For the benefit of those who still believe that to preserve their beauty, it is necessary to burn out the blemishes with a blaze of light, it is our humble opinion that there is more security in Dryden's ancient lines, as true now as when he wrote them.

"'Tis every painter's art to hide from sight
and cast in shades what seen would not delight."

In the accompanying cuts, Plate A shows various treatments of the full face, and we may learn something by studying each individually.

No. 2 A. Shows the lovely Venus transformed into a stupid, gross featured, flat nosed, blear-eyed individual. Note the ugly cast shadows, from the nose, across the cheeks, and also, how well defined are the imperfections on the surface of the model. This effect is achieved by the popular burn-up method of throwing strong, open arcs, at the same angle, across the face. The whole is flat and uninteresting.

No. 4 A. Is a similar effect, except that the photographer has thought to help the situation a little by diffusing the light. However, it is still flat and uninteresting, due to too even a distribution of light. See how broad is the bridge of the nose, the eyes still dull and stupid, the mouth thick lipped and sensual and the surface of the face blotchy.

No. 3 A. Is more engaging, but is harsh and contrasty, and tends to destroy feminine delicacy by suggesting more an Adonis than a Venus. Observe the square, sharp cut effect of the nose and eye sockets. However, the eyes begin to assume a little expression—they are enveloped in shadow and the imagination comes to the aid of the plaster Venus. But study the surface—there is no disguising the fact that she is nothing more than cold, hard plaster.

No. 5 A. Here, the photographer has attempted to burn out a little fullness under the chin that seems not to have worried Venus, but annoys some of the present beauties. This method may accomplish its design, but see what else has happened—it makes Venus' right cheek appear inflamed with the tooth ache and her expression gives evidence of the pain—her eyes are rolling up in her head and her nostrils are twitching in her paroxysm.

No. 1 A. Shows the ideal system of lighting. All the features are softly rounded and modeled. The lovely work of this ancient and unknown sculptor is preserved and reproduced in all its feminine delicacy and charm. Compare the beauty of the lips and the sweetness of their expression to the other reproductions. Study the dainty modeling of the nose, how round and shapely the head and we can almost feel the presence of the eyes. But most important of all, the imperfections on the surface of the cast are hardly noticeable and there is almost a feeling of flesh rather than the hard, cold plaster-paris.

Plate B.

This group shows the three-quarter view. This is an interesting pose of the head from the standpoint of drawing but presents a broad, flat area of cheek, which is not easy to keep from appearing flat. This pose is generally used under the assumption that one side of the face often appears more favorable than the other.

No. 2 B. Is softly back-lighted and the right side held in shade to present a little mystery to the imagination in taking care of the broad area of the cheek, also to hide an ugly blotch on the right cheek.

No. 4 B. Is the same pose, lighted too contrastily and gives a sharp, angular effect down the center of the face.

No. 3 B. In this picture, the few pleasing points of the two preceding lightings are destroyed and no semblance of effect remains, due to too strong and direct a light on the right cheek. Note how the blotches show up as soon as the harsh light is used, also the rough spots and deep, ugly shadows on the left cheek. Observe also the unbalanced expression of the eyes and the lack of any feeling of distance between the extremity of the nose and the right ear. This is just as apt to happen in photographing the living model.

No. 5 B. Here, the small area of the right side is held in shade and an attempt is made to throw the eyes in the shade to create expression and an apparent direction of vision. This scheme of lighting is favorable to light blue eyes. That portion of the cheek which bears the ugly blotch, is also shaded and there is beginning to be a feeling of roundness and distance between the nose and ear.

No. 1 B. Here there is a perfect sense of roundness. Note how the two cheeks seem to lead around to the back of the head. Observe the delicate modeling of the eyes and lips. The living model would require a little stronger reflected light in the shaded portions, but with the cast, too strong a reflect would give a crossed effect to the eyes. This like No. 1 A, is a very fair representation of the work the great and unknown sculptor and all of these different lightings show that the camera can become a great liar.

We do not deny, however, that for dramatic reasons, some of these effects may be desired rather than avoided, and for those who may be interested, we offer a series of plans showing each arrangement of lighting:

100 represents the full, open unit (arc or globe)
75 a lesser amount, undiffused.
D the full unit with one diffuser.
DD the full unit with two diffusers.
TD the full unit with triple diffusers
R reflector.

We have just received word from Jackson J. Rose A. S. C., that he has returned from a desert location trip near Guadalupe, California. Rose as chief cinematographer on Universal's "The Foreign Legion," and Edward Sloman, director, spent several weeks on the desert location with a company which included Norman Kerry, Lewis Stone, June Marlow, Mary Noolan, and Walter Perry. Other A. S. C. members who assisted Rose's filming included Harold Smith, Milton Brickenbecker, Howard Oswald, Edward Wetzel, and Frederick Eldredge. Many new ideas were injected in the filming of the scenes in the desert. For the first time, moving shots from caterpillar tractors were used in following an army marching through the desert. For storm effects eight of the largest wind machines obtainable were mounted on tractors to follow the troop, making realistic sand storm effects as they moved along. The resulting pictures were startling, unusual, and very beautiful. Roy Hunter, head of the Universal camera department, has expressed the opinion that the desert scenes obtained are the most beautiful he has ever seen.

Lubrication of M. P. Film

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the perforations has been described by J G Jones.[1] This [1] "A Film Waxing Machine" by J. G. Jones, Trans. Soc. M. P. Eng., No. 15, 251 (1922).

consists essentially of two parallel thin steel discs separated by a distance of 1-3/32" rotating in a vertical plane. The discs dip into a bath of molten paraffin wax and apply the wax to the film at their upper edge. The quantity of wax applied is controlled by the thickness of the discs, the temperature of the molten wax, and the rate of travel of the film.

Precautions to be Observed when Edge Waxing

The above method of lubrication is entirely satisfactory providing the wax is applied correctly, and no better lubricant than paraffin wax is known to date. However, if the temperature of the molten wax is not sufficiently high during application, too much wax is applied by the discs and this does not solidify sufficiently before the film is rewound. This causes the wax to cement the edges of the film convolutions so that on rewinding, particles of wax are torn away from the film and these tend to encroach on the picture area causing spots and blotches on the screen. This is harmful particularly in the case of film with an edge sound record.

Another very serious danger resulting from the application of an excess of wax arises if the projector is threaded while hot with newly waxed film. As the projector cools, the wax solidifies and holds the film so tightly that on starting the projector, the intermittent sprocket may tear out the perforations instead of pulling the film down through the gate. Since the fire shutter opens immediately when the projector starts, more or less film is apt to be burned up if the film does not start to move down promptly past the aperture.

A series of practical tests was made in this connection to determine the exact conditions under which candle edge waxing or Eastman edge waxing tends to cause the above trouble.

Film was first waxed with a waxer of the candle type which normally applies an excessive quantity of wax. After focusing the light ray from a 30 ampere reflector arc on the aperture opening of a Simplex projector for 30 minutes, this projector became heated to a temperature which would normally exist after the projection of a reel of film. Film waxed in the above manner was then threaded in the heated projector and left to cool for forty minutes. After cooling for such a period the projector had attained room temperature and any wax in the gate had hardened. On starting the projector, the intermittent sprocket tore through the perforations leaving the film stationary in the gate. Upon examination of the samples, it was found that the wax had softened and collected in the perforations and had cemented the film to the film tracks and the pressure springs.

The possibility of this difficulty occurring when film was waxed with the Eastman waxer was then determined. The projector was cleaned thoroughly and a one thousand foot reel of film waxed with the Eastman waxer was projected in the normal way. Immediately after projection the projector was threaded with a length of unwaxed film and allowed to cool. When the projector was started the film pulled down through the gate with no difficulty. Several thousand foot rolls were then waxed with the Eastman waxer and projected in thousand foot units running each reel through the projector only once. After the projection of each reel the projector was threaded with unwaxed film, allowed to cool, and then started. No trouble was experienced until several thousand feet had been projected when enough wax had collected to hold the film from being properly drawn through the gate. After cleaning the projector, it was possible again to project several thousand feet of waxed film before enough wax collected to cement the film, but after each 8,000 or 10,000 feet, the trouble was almost sure to occur.

"Shoot 'Em With Sun Spots"

Tests were then made to determine the quantity of wax which could be put on the film before it could be classed as waxed film which would cause trouble by sticking in the projector. Several strips of film were prepared by waxing on the Eastman waxer, once, twice, three times, etc. In this way film coated with a known quantity of wax was obtained. The projector was then thoroughly cleaned, heated for thirty minutes, and threaded first with film which had been waxed once and allowed to cool. This procedure was followed with the film waxed twice, three times, etc., successively until indications of sticking in the gate were discovered. Repeated tests showed that trouble was not likely to occur unless the film was waxed for five or six times and therefore contained five or six times the quantity of wax normally applied by the Eastman waxer.

Research and Inventions

(Reprinted from The Exhibitors Herald)

The other day a group of technical men employed at one of Hollywood's greatest studios were talking of the various and sundry individual plans of research known to be in process of working out, when somebody inquired of Daniel B. Clark, president of the A. S. C. what a certain friend of his had accomplished along a line of research he had been following for almost a year.

"He is making progress," replied Mr. Clark, "but the producer is so niggardly with his research budget that he is not able to proceed as rapidly as he could if he had an adequate fund to draw upon.

"In fact the allowance of this man is so small (and this is one of our largest studios) that he is not able to use any initiative which is the very life and inspiration of all research. Instead, therefore, of proceeding along original lines he is forced to await opportunities offered by regular production to make progress in research—to make the experiments his intuition prompts.

"Such a policy toward the research department is at best short-sighted for it stands in the way of the very thing the producer seeks to bring about—better methods of photography, new effects, better ways of doing things, saving of time and money.

"And this," continued Mr. Clark, "calls to mind another evil that threatens the very life of motion photography—the multifarious patents on process shots of various kinds.

"It is getting so that producers are afraid to seek for the unusual in photographic effects lest they bring down an avalanche of lawsuits on their heads.

"Most of these are vitiated by priority of use on the part of cameramen who employed them years before the 'inventors' took out letters of patent on them, but while members of the A. S. C. know this and use the shots as they like, the producer does not know it and either does not employ the shots or is strong-armed into paying for them.

"Of course there are some legitimately patented process shots, but more of them are of no force if the truth were known, and it is time the truth were known when studios are taking out patents on their own inventions and special processes, not to sell them, but to prevent some pirate patenting them and placing all producers under tribute for their use. This, I should say, is rather an undesirable situation and one that needs clearing up.

"And this is just what the A. S. C. is going to do as a part of the house-cleaning of the industry, for very soon our Society will invite all the inventors of special processes, etc., to meet the producers at a special session of the A. S. C. so that it may be established without question just what claims are valid and what claims are erroneous. This will go a long way toward clearing the atmosphere.

"The A. S. C. is made up of men of wide experience and exhaustive research in cinematography and few tricks have escaped them. For the most part they have been too busy to commercialize the results of their discoveries, but have been glad to pass their better methods on to their fellows without consideration. The situation, however, is becoming serious and a show-down is absolutely necessary."

Tribute to Mr. Bausch

More than 300 of Rochester's social and financial leaders banded together Thursday night, November 10th, to pay a tribute of affection and respect as well as loyalty to William Bausch, secretary of the Bausch & Lomb Optical Company, manufacturers of photographic lenses and other optical instruments.

The occasion was the celebration of Mr. Bausch's twenty-fifth anniversary as president of the Rochester club, the leading as well as oldest social organization in the city.

Mr. Bausch

A judge of the state supreme court, a poet, two members of the club and representatives of employees of the club told in their various ways of the deep friendship and affection their different groups feel for the "father of the Rochester Club."

A silver vase I presented to Mr. Bausch as a token of esteem was filled with twenty-five American Beauty roses, a thoughtful memento from the employees of the club.

In his reply to the various speakers, Mr. Bausch said that only in service to his fellows can a person be worthy of the highest estate of manhood.

News Man Saves Old Glory

(Continued from Page 10)

had been any destruction of foreign properties, etc. After many and long conferences we were allowed to proceed to the American Consulate grounds, but, I was all the time followed by two officers.

The Consulate was looted, window panes broken and the archives apparently destroyed. Then I saw the American flag on the ground. It was the same American flag which on the evening of March 23rd had signalled S. O. S. to the destroyers on the river, too late to save some American women from terrible outrages committed by Chinese soldiers, and—well, it may be good policy not to say anything more. But a lot more could probably have been done to prevent those disasters if some of the American officials in Nanking had acted in time.

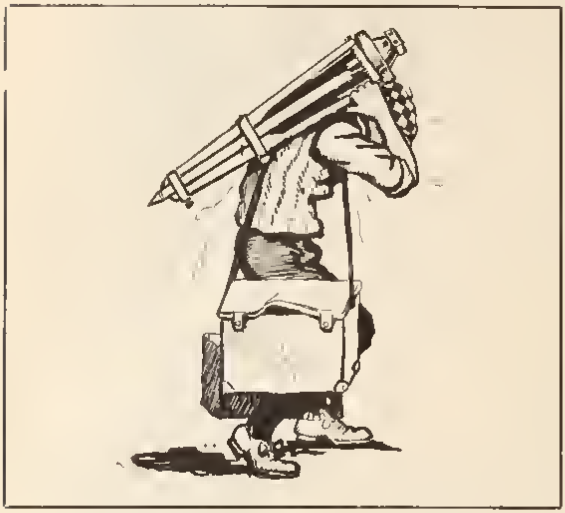
There was the flag. It was torn, desecrated. Pieces of it were used for purely insulting, unclean purposes. I leave the rest to the imagination. I motioned to the boy. The good chap understood me immediately. I told him to go and ask one of the officers any foolish question he liked. He went. In the meantime I had manipulated the flag under me. Then I signalled to the boy. Without uttering a word he came to me and motioned to me to tuck the flag under his shirt. At that moment the guard advanced and we had to be quick about it. I got the flag inside his shirt, but when he turned around a piece of it "flagged." I whispered to him to sit down. He lay down, thus covering the red and greyish white colors which would have betrayed us—and if we had been discovered, well—there was only one thing that could have been expected from the Chinese.

Fortunately the guards' attention was drawn to the consulate's dog which the consul had left behind when he fled. I motioned now to the boy to advance, got the camera out of the case and tucked the flag inside the case.

Off we went. But then somebody remembered the flag and got suspicious. They questioned the boy if he had seen it, but he of course did not know anything about it. The news about the flag got to the General's headquarters I believe, because the boy came to me the following day saying that he had been threatened with death and the best thing we could do was to disappear.

The flag was returned to the American Consulate General at Nanking, but I never got an explanation of the peculiar behavior accorded us on board the Mei-Lu. Maybe they thought us to be Bolsheviks!

Jimmy The Assistant



THE GOLDEN GIFT OF GAB

I'm the only permunant guy in pictures. Little extra kids which used to bum light tests off me to take home and dream over has become big stars; flaming youths who used to run around delivering office mail with four pimples and a whisker is now way up in the Brain Department warming a big leather chair with a secretary and is harder to see than the Pope, and even guys that used to be camera-punks and drop magazines right along with me has had their spell of being a first and some of them is even setting in a director's chair with a deep voice and a megaphone to use it through; but as for me—I'm still picking 'em up and laying 'em down—Jimmy the Camera Punk—always was and never will be. I got as much chance of being anything else as Will Hayes and Welford Beaton has of kissing. Every time I get in line for a raise or permotion the studio closes down, and I'm out in the cold like a Polar bear's nose. Or, if that don't happen I always manage to make some break and get fired for it, which, taken by and large, and carefully considered from every angle with due regard to all the facts of the case, amounts to much the same thing so far as I'm concerned. But I don't mind getting fired. I'm used to it. I've been fired oftener than Bill Hart's gun.

I once asked one of my many bosses why this was, and he told me I talked too much Giggle **that** awaft. Talk too much my eye! It ain't possible. This whole blessed business is run on talk.

A guy that ain't a good fast oily talker has got no chance in the Silent Drama. Every good job is got on talk, held on talk, and lost by not enough talk. Writers tell their stories, directors tell their ideas, actors tell their interpretations and girls tell their mothers. Talk, talk, talk! A studio on a busy day uses more words than the International Convention of Orators. Talk too much mu aged aunt! A good line of chatter is doing all the work that used to be done by brains in the old days. You can get along without sense in this game—it's kinda in the way anyway—and you don't have to know anything about pictures; but lose your line and you're sunk. How many producers that's sitting in the saddle right now has got anything to point to in the way of actual successful perductions to alibi their positions? How many of them shows anything that could be figured as picture sense? And ain't it true that if they was in any other business and pulled the kid boners they do that they'd be out on their necks in a split second? The answer is yes! They ain't business men, they aint picture men, they ain't artists; but you should hear'em when they get going good at an executive meeting. Boy, it's just beautiful, no kidding.

Not that I care a hang More power to 'em for getting away with it. But all this bedtime story stuff about still waters running deep and all that belongs out in the stable with the rest of the horses. Just lemme give you an example

You're a cameraman That means you got to know pictures. Cameramen can't bluff like other folks. When they shoot a scene it stays shot, and you can't add or take away from what was put there. Cameramen can't guess. They got to know. There ain't no time to sit down and write to Rochester about exposure when there's people waiting on the set. Whatever a cameraman does he has to do on positive knowledge acquired by actual experience of years of training.

There ain't no argument against the fact that the cameraman that is a cameraman knows more about actual picture making than anybody else in the studio. According to all the laws of common sense there ought to be more directors made from cameramen than from all other departments put together. They ain't, though, which is just another proof that the laws of common sense has been repealed so far as studios is concerned.

Now suppose that you've got so sick of telling sap directors what to do that you decide to make a stab at directing alone, instead of shooting and directing both. You finally get in to see the Main Brain and what happens? You talk, brother, you talk! There are ninety-seven other guys all after that same job, and you gotta tell why you're the best one for it. And when I say 'tell why' I mean you gotta tell why. You can't show why. You ain't got anything to show. You ain't never directed a picture in your life—that's got your name on it Yea, sir! You gotta talk plenty fast, because there's a lot o' fast talking birds with plenty pictures back of 'em all after that same chance. Talk? Boy, you'll talk, or else! And that ain't all. You got to bluff.

Bluff does it. The guy you're talking to bluffed his way into his job, and is holding it on bluff.

You gotta bluff this head bluffer into swallowing your bluff. Sweet job, ain't it?

Go on past performances and you're sunk. If past performances meant anything—if absolutely established facts meant anything the whole picture business would be lots different than it is. It ain't what you've done, but what you say you're going to do that counts. And the guy that tells what great things he's going to do, and tells it the loudest, wins the hokobolos.

So when you get in to see the Main Brain you gotta absolutely sell him the idear that you not being a director is all that's wrong with the movies. Do that and you'll get the job. Get the job, and you've done the hardest thing there is about making moving pictures. But it'll take talk to do it—nothing else get over.

They say talk's cheap—but it cost the movies plenty.

Facts is facts, and the guy that kicks against hard facts just gets a sore toe for his trouble You might just as well admit that as long as the good talkers has more Rolls Royces than socks it's a good idear to learn how to talk, when to talk, and who to talk to.

Trouble with me ain't that I talk too much, but that I talk too little, and don't time it right when I do. I oughta talk all the time—then I'd be right some of the time anyway. Lemme give you just one example.

There was a first cameraman come to the Iot, a forrener from Checkovia or somewhere, and he talked Englsh like a excited Chinaman trying to recite a Bjornsjern-Bjornsjern poem backwards with the original language. He didn't make sense. I figgured out that the poor gpy was up against a tough break and figgured to help him out all I could. The first day's

work was all exterior, and how could a guy that couldn't even read a no smoking sign read the reely intrickate figures on a lens? I couldn't figger how he was goin' to get by, not bein' able to read stops or nothin', and me not able to tell him so's he'd know. If I told him 6.8 he'd think I was talkin' about fast waltz time. Well, I worked all night the night before we started—worked like a son-of-a-gun, and soldered all his lens stops at 5.6, but left the diaphragm rings loose so he could play with them if he wanted to. Pertectin' him, you see.

We got out and started, and you should have seen this guy do his art. He was slower than the next raise. I had to laugh when I see him figuring exposure. He had a actinometer with more different gadgets on it than a flute has toots, and everytime he'd work it he'd forget something and have to start all over. All this got over big with the boss. He was getting art at last. Then this guy sets his stops as careful and delicate as a blind man peeling a cactus. Finally we gets the scene, and a few more before dark.

Next day we all goes into the perjection room sollem and expectant as a kid alone in a haunted house. All except me. You know, and I know that anything shot at 5.6 in cross sunlight is as safe as if it was in God's pocket, so I wasn't worried. The stuff come on and it was beautiful. You should'a heard 'em rave. This guy blushes, and stammers, and gets up to take a bow, and just then I beats him to it. I ups and told 'em how I saved the day. Was they grateful? And did that guy thank me for savin' his job? Don't be silly! I was about due to be fired again anyway, so it didn't bother me none. I guess I must have spoke at the wrong time.

But because I flop a thing ain't nothin' against it. I can get a bum break out of anything. Bet you if I flipped a double-headed penny and hollered heads it'd stand on edge. But what I said about talkin' is right, even if I can't do it myself. Learn to say the right thing to the right guy at the right time, then talk your head off. That's all there is to succeeding in the movies.

Stolen--Most Valuable of All Photographs

The Royal Photographic Society of London recently held an exhibit in its building at Russell Square, and one of the most interesting of the items shown was a photographic slide measuring three and a half inches by half an inch. Looking at it with the naked eye revealed nothing but the slide itself. It appeared to be ordinary glass, of no particular value, yet the directors of the society considered it to be the most important and valuable exhibit shown.

It was, in fact, priceless. Upon the small slab of glass was mounted a photograph. The picture, a likeness of J. N. Niepece, the French inventor who contributed a great deal to the science of photography, was microscopic. It was so small that three hundred reproductions of it would only occupy the space of a pinhead. Magnified 160,000 times, the photograph of M. Niepece would be an oval and a little more than an inch deep.

The exhibition was open evenings until 9:30, and on the final day of the show the unusual photograph was still in its case. But the next morning it had disappeared. The matter was at once reported to Scotland Yard. The police were sure that the theft must have been carried out by a collector who wanted it for his museum, as the value of the photograph is not intrinsic. It was the property of the British Photographic Research Association, who had loaned it to the society for its exhibition.

Small hope is held out for the recovery of the photograph for some time to come, but the police are confident that sooner or later the culprit will be apprehended and the picture recovered. The collector who stole it—and Scotland Yard is positive that it was a collector—will be tempted, they feel sure, to exhibit his prize. He will undoubtedly pledge to secrecy those who are given a chance to examine the photograph under the microscope, but human nature will make it impossible for every one of the favored ones who see the photograph to keep the secret.

The Camera Rules

A dispatch to the Christian Science Monitor from its Washington bureau tells this story of the absolute rule of the cameramen over our great men at the National Capital:

Great is the power of photographers in Washington. Officials, from the President down, obey them. They take precedence over ambassadors and ministers, admirals and generals, and may rightly be termed the fifth estate.

The most important visitor to Washington one day recently was Dwight W. Morrow, about to take up the important mission of Ambassador to Mexico. He was closeted with Frank B. Kellogg, Secretary of State. The "White House photographers" shouldered their cameras and walked across the street. When Mr. Kellogg emerged from his private office he found two chairs, one higher than the other, placed beside a table and the photographic phalanx waiting.

"Is this a battery?" Mr. Kellogg inquired.

"We want Mr. Morrow," said a photographer in answer.

The Secretary of State obediently called Mr. Morrow.

"You sit in that chair and Mr. Morrow in the other," a photographer ordered.

"Talk," was the command and Mr. Kellogg made motions with his lips. Mr. Morrow looked self-conscious.

"Look at me, Mr. Morrow," one photographer said. "Look right into my camera here."

Then another photographer gave a similar order, and the new ambassador shifted his glance.

"Sit closer together; lean forward, do this for the movie men; now for the other photographers. Are you going to the White House from here? Well then, Mr. Morrow, you go down to the first floor and stand at the door. We will come down there and take some more pictures."

A flash! That was the end of that session. Mr. Kellogg arose promptly, and as the smoke cleared the photographers folded their paraphernalia and departed to "get" Mr. Morrow again.

"I did want to work on that French note," said the Secretary of State ruefully as he watched the precious minutes escaping. That was of no interest to the photographers. They got what they wanted.

Transactions Of S. M. P. E.

[*To our esteemed Mr. Herford Tynes Cowling, A. S. C.* THE AMERICAN CINEMATOGRAPHER *is indebted for the following excerpts from interesting papers read at the September meeting of the Society of Motion Picture Engineers. Later the full text of these papers will be printed.*]

Behavior of Gelatin in the Processing of Motion Picture Film

By S. E. SHEPPARD

(Extract)

Scientific investigation has shown that the gelatin photographic emulsion layer, which with the "celluloid-like" support comprises the film, is subject to considerable physical change due to swelling and shrinking. Excess swelling or shrinkage of the gelatin in a direction perpendicular to the film surface does not make itself noticed but that taking place along the surface is resisted by the unyielding support with the result that the film tends to curl up into a tubular shape. If a strip of motion picture film is curled in this manner the picture projected from it will, when viewed on the screen, appear "fuzzy" in places and will seem to sway back and forth producing an extremely disagreeable effect.

It has been found possible to prevent this effect entirely by the careful choice of gelatin in manufacturing film and by the use of processing solutions having the correct chemical constitution.

Our Brothers in the East

Here are a few interesting happenings in the East, as sent us by our friend and brother A. S. C., Mr. Herford Tynes Cowling, chief cinematographer of the Educational Department of the Eastman Kodak Company, Rochester, N. Y.:

"Mr. Charles H. Bell of the Ray Bell Film Company, St. Paul, Minn., is just starting on a year's trip to Central Africa with the O'Brien-Burbridge Expedition to obtain photographs of gorillas, pigmies and other interesting things in the Congo and in German East Africa. Mr. Bell is an experienced cameraman and has promised to write me some letters giving accounts of his work for publication in the A. C.

* * *

"In December Mr. Earl Rossman is leaving on a photographic expedition to the northern part of Alaska. Here he will be working for nearly a year. Rossman, as you know is an old hand at the Arctic game, having made his last trip with the Wilkins Flight Expedition and having made several previous photographic expeditions to Alaska, during which he photographed "Kivalina of the Northland," the only native Alaskan film drama ever taken.

* * *

"Mr. Cerveth Wells, lecturer, and Mr. Donald Thompson will take a movie expedition into China and the Gobi Desert on a three-year trip. They hope to come out across Chinese Turkestan. Mr. Thompson is an old hand at the game, having done considerable correspondence work during the war and photographed "The Battalion of Death in Russia," which was the Russian ladies'

A Misplaced Thrill

Arthur Edeson, photographer of First National's big war picture, "The Patent Leather Kid," starring Richard Barthelmess, has photographed many of the biggest film spectacles and has had enough hair-breadth escapes to fill a small volume.

His closest call, however, was in one of his earlier pictures and not in "Robin Hood," "The Thief of Bagdad," or "The End of The World," three of the biggest pictures ever made for the screen.

It was in "The Dollar Mark," the old World picture directed by Oscar Lund, with Robert Warwick.

"We were photographing scenes on the rapids in Wilmington Falls, Lake Placid, in the Adirondacks," Edeson said. "I was on a raft with one of the old Pathe cameras. It was lunch time, and for some strange reason I didn't know it.

"From the shore, they started to pull the raft towards land, and threw me off my balance.

"With the camera over my shoulder I went into the icy water, the weight of the camera taking me down rapidly.

"I clung to the camera, however, and together we went over the falls, about the time that both Lund and Warwick plunged in, to my rescue.

"How I ever got out of that situation alive I will never know. But I did, and what is more, we saved the camera.

"We took it apart and dried it out, and by four o'clock we were shooting again. All I lost was a lot of breath and the film we had shot just before the accident.

"It was my closest call, and I never want to have another similar experience."

The new home of Tremont Laboratories, Inc., just completed at 823-5-7-9 Seward Avenue, Hollywood, by H. H. McMurphy, for Horn and Glickman, formerly of the famous Tremont laboratories of New York City. The plant cost $100,000 to build and equip, and is claimed by the proprietors to be the most up-to-date in the industry.

Film Industry In Switzerland

By A. Herz, *Editor Camera, Lucerne*

One can hardly as yet speak of a film industry in Switzerland since, with the exception of a few small studios where industrial or educational films are produced, this country is entirely lacking in dramatic film studios.

However, this is soon to be changed for efforts are already being made to attract this industry here. Negotiations with German producers are now well under way and America would do well to turn her attention to possibilities here. When one examines the matter more closely it is evident that this country is in a position to offer film producers unusual advantages.

First, there is the question of electric current. Switzerland offers studios power at a very much lower price (perhaps about one-tenth of the American price) and, when one remembers that it is just this lavish use of electric light which is one of the reasons for the great beauty of Hollywood productions, this factor cannot be too seriously considered.

How many German pictures show the effect of insufficient lighting! There is indeed a very great difference in the quality of pictures which have had just barely sufficient lighting and those which have not suffered from economy.

The second factor in favor of Switzerland as a home for film studios, and in particular Central Switzerland, is the astonishingly beautiful landscape ready to hand, from the idyllic to the heroic being only a step. One can choose sites commanding incredibly lovely backgrounds without going further.

Another important point to remember is that the people of Switzerland are very gifted dramatically; almost every one takes part in theatricals and outdoor fetes without end. In short, there is the richest material at hand here. Again, this country is an excellent film market in itself, two hundred and thirty cinemas being already in existence, to which one could add a whole chain of newly built giant picture houses in the larger towns.

Should film production become a home industry, these houses would be the first consumers. Those who know the patriotic feeling of the Swiss people realize that genuine Swiss films would be in the greatest demand by all theaters. Swiss products are always given preference by the people here. In addition to this factor one may safely anticipate that Swiss films would receive most favorable protection.

In short, the outlook for local film production is exceptionally favorable from every standpoint and Switzerland is admirably situated for the making not only of films dealing with local character or exploiting its wonderful landscape, but of all that is comprehended in the work of the great ateliers abroad.

Getting The Stuff

The Gentle Art of Shooting Pictures is Full of Excitement

By IRA MORGAN, A. S. C.

Imagine sitting on a small platform, crazily swaying on a couple of long ropes that suspended it a few feet over the middle of a churning, boiling river, where the slightest mishap might mean death to even the strongest swimmer. It would be a diverting experience, to say the least, even on solid footing—but with nothing but a couple of swinging ropes between yourself and doom—well—that's a situation calculated to keep a man from brooding over the affairs of the Motion Picture Academy!

This was a little thrill a few of the boys in the Metro-Goldwyn-Mayer camera department enjoyed not long since. And, as they hung on the swinging parallel, they had to keep their minds on their cameras—pick out the most spectacular spots in the boiling rapids and transfer them to celluloid. No—the boys weren't thinking about what they were going to have for supper that night.

It happened upon the Copper River in Alaska, when Metro-Goldwyn-Mayer sent Harry Schenck up with a party of cameramen to film inserts for "The Trail of '98," Clarence Brown's big Klondike picture. Bob Roberts, Faxon Dean, Chet Lyons, Bob Newhard and Pierra Mouls made the trip. One of the important shots wanted was a close-up of the White Horse Rapids in action—and a perfect replica was found in the Copper River rapids, a short distance further south—but equally as spectacular. The rapids, in fact, are even more dangerous, coming down a rocky gorge into a perfect maelstrom of seething foam.

Schenck and his party, together with a few guides and a camera pack train, passed several days investigating curves in the stream and possible vantage points, but decided that nothing taken from land would show the real fury of the turbulent waters. Then they decided on a bold procedure.

Getting a couple of heavy ropes across the stream by the expedient of using a string to haul a cord across, then a small rope and then the heavy cables, they flung a double cable over the river, anchored to trees. A parallel, or camera platform was fixed between these parallel ropes, the cameras and cameramen placed on this, and it was slowly pulled by rope to its teetering perch at the center of the stream.

Here the men hung, about ten feet over the water. Every move set the platform to careening wildly.

"The thing to do," decided Lyons, "is for us all to sit perfectly still, until she stops swinging—then we'll shoot."

For twenty minutes, scarcely breathing, the men sat on the platform as its pendulum-like swing slowly quieted down, then so cautiously as not to start it swinging again, they cranked their cameras. All the time the giant rapids roared beneath them.

Afterward came the trip back, clinging to the parallel as it jerked, swayed and bobbed.

Yes—a cameraman every now and then gets a thrill out of his calling. Percy Hilburn, for instance, sat in a pit, covered with boards and turf, through which his lenses projected to film the thundering hoofs of the horses in the "Ben-Hur" chariot race as they galloped over his head.

Had a hoof come through the planking that covered him—Percy wouldn't be grinding today. Every time one of them thumped on his thin protection Percy realized this. But when it was over he packed his camera and philosophically prepared for the next shot.

In this he and his camera perched on the back of a trailer that ran just ahead of the horses, and about three feet from the ground. The trailer was started by motor, then ran ahead by momentum so that it wouldn't jar or spoil the film. Had it stopped a little too soon it would have spoiled Percy—but that again is a chance

a cameraman takes once in a while. Percy laughs over it today—but he looked a little pale, even through the dust that encrusted him, when the motors dragged him away from a position about six inches from the front feet of the galloping chariot team.

Almost every picture has a thrill in it somewhere that the audience never sees, and that the cameraman usually enjoys exclusively. The writer got one lashed to a battleship mast over a pair of fourteen-inch guns during target practice in "Tell It To The Marines." The concussion was so heavy that it seemed as though it would snap the lashings of camera and platform on the mast. Shooting the chase with the rum runners, from an Eagle boat at night, in "Twelve Miles Out," provided another thrill. They had my feet fastened down so that the waves couldn't wash me off—and the camera anchored. Every now and then I got a good slap from about half a ton of water. No sailor's life in mine.

Paul Scholokow and Douglas Shearer, brother of Norma Shearer, the star, had one of the most thrilling experiences in a long time in the filming of "Rookies." Each was lashed with a camera on the wing of an airplane, and they had to film another plane as it dropped a dummy onto a captive balloon. The planes, in following the movements of the one with the dummy were sometimes nose up, sometimes nose down—the men were turned every way except right side up Nothing under them but thin air. Yes—there was a thrill to it—to say nothing of the thrill of landing, perched on a wing. One can't help wondering if the pilot will get her down safely with one wing out of balance from a man's weight.

Thrills—yes, we have 'em.

Recent Development in the Pre-Focusing Base and Socket For Projection Lamps

By A. Burnap

(Extract)

For those classes of motion picture projectors which must be operated with a minimum of attention and without the supervision of a skilled projectionist, the tungsten lamp has come to be indispensable. A projector equipped in this way and used for advertising purposes or in a church or school auditorium must operate faithfully day after day. When a new lamp is put in the machine because the old one has become blackened or has burned out, the filaments of the new lamp must assume the exact position of the old or the picture will be very unevenly lighted Even this delicate process has been made very simple by the use of the so-called pre-focusing lamp and lamp base. A newly developed arrangement for this requires only that the base be properly adjusted in the projector lamphouse after which a new lamp can be placed merely by pushing it into the socket and rotating it through a one-quarter turn Only a few seconds are consumed instead of several minutes as previously.

The Structure of the Motion Picture Industry

By William A. Johnson

(Extract)

The motion picture industry has grown in a few years from a sideshow novelty to one of our great industries. Of the billion and one-half dollars invested, five-sixths of it is in theaters and the remainder in producing and distributing organizations. Much has been written about the "stars" and the producing companies but the existance of that important branch, the distributing organization is hardly realized. It is this wholesaler who brings about the rapid circulation of pictures to all parts of the world. It is through this agent that the inhabitants of the back country and even the remote corners of other continents are able to see the latest from "Broadway." Forty per cent of the film production in America goes to make up eighty-five per cent of the movies of the rest of the world.

Nearly half of the population of the United States attends a motion picture exhibition each week. The motion picture theater is fast making a name for itself as a center of culture which offers the utmost in entertainment and comfort.

The Movies Shoot High

Army Ace Finds Greatest Thrills While Piloting A. S. C. Cameraman During The Filming of "Wings"

By Lieut. E. H. Robinson

[While shooting air sequences for Paramount's story of the American ace, "Wings," at San Antonio, Texas, Lieut. Robinson and two cameramen ran into a terrific sleet storm at an altitude of 11,000 feet. For more than twenty minutes they were entirely lost. Lieut. Robinson could not even see the instrument board before him. Here is his own story of the experience.—Editor's Note].

Many thrills have been tucked away in the fuselage of my ships in the past and particularly in training, but the greatest thrill of my life came while piloting a camera ship in making a certain sequence of air shots above the clouds for Paramount's great road-show, "Wings," at San Antonio, Texas. As I look back upon it, Cameramen "Buddy" Williams, Faxon Deane and I were very fortunate to get out of this jam with our lives. As this is being written, however, it merely takes the place of a gigantic thrill.

On the day of this one incident we had postponed flight until late in the afternoon simply because Director William Wellman needed a background of great clouds for the sequence, and these had been missing the earlier part of the day. In the afternoon they gathered and we made preparations to take-off. Richard Arlen and Charles Rogers, featured players in the production, took to their own "ships," and we followed as quickly as possible. Arlen and Rogers had fast "ships" of the "P1" and "02" type, while I piloted a large three-passenger "ship" of the bomber type.

After climbing steadily we encountered the first layer of clouds at about 4,500 feet. Upon getting above them, we found the light still insufficient to take the scene, so we proceeded to climb to the next layer. I reached these at an altitude of about 8,500 feet, which was almost the ceiling of my ship. We found there that by flying northwest a beautiful background could be obtained for our shot, so I headed the bomber in that direction and signalled the pilots of the other ships to carry out their maneuvers as pre-arranged. Through some misunderstanding of signals, it was quite some time before the other ships got in their proper positions.

All of this time the peaks of the clouds had been rising, which necessitated my climbing higher. I now was at an altitude of about 11,000 feet—the absolute ceiling of the bomber. From time to time I encountered peaks of clouds rising in my line of flight and therefore was required either to fly through them or around them. Both of my motors were very cold; the temperature probably being, at that altitude, somewhere in the vicinity of zero. While flying through the peak of the clouds one of my motors, due to its coldness, "knocked" (stopped), thereby sinking me down again.

After a few minutes I realized that it was futile to attempt to pick my way out—so, idling both motors, I started down. I then realized we had fallen into the heart of a cumulous storm cloud in which violent convectional currents were at work.

Soon my goggles were covered with ice and frozen to my face. I was unable to see the instrument board before me. The camera, which was mounted on the nose not five feet distant, was but a dim shape. Not knowing whether we were right side up, upside down, in a tail spin or falling leaf, other than by "feel," I fought to keep control of the ship as we made our perilous descent. Every few moments I pried the goggles from my eyes and peered at the alti-meter through the haze. Five thousand feet and no sight of land. Six thousand feet and no sight of land, eight thousand feet and still no sight of land, and then the feeling came over me that it would be necessary for the two cameramen and myself to take to our parachutes.

I knew we were over a mountainous part of the country and that the hilltops probably would be fifteen hundred feet higher than the field from which we had taken off. When we had descended 9000 feet and still I could not see the ground, I called to the cameramen and told them that if ground was not sighted within another thousand feet we were going to jump. Even then I was reluctant to call upon two inexperienced men to make parachute jumps and turn loose the ship which I knew would cost $40,000 to replace.

Left to Right—"Buddy" Williams, Lieut. Robinson and Faxon Dean.

But another thousand feet we broke through the clouds and sighted the ground just eight hundred feet below us. A hurried look served to show me that we had been very fortunate in coming out in the center of a valley, which was entirely surrounded by high hills disappearing into the clouds. In other words, a mile and one-half in any other direction would have unquestionably seen us crashed into a mountain.

I picked a likely looking field, glided for it—approaching it "into the wind"—and made a good landing without injuring anything or anybody. I was informed by some natives who ran out to the plane that we had landed in the town of Comfort, fifteen miles north of our starting point. We were soaking wet; almost dead from the cold, but you can rest assured we were comfortable in mind in spite of the ironical name of the town in such a predicament.

And, also, we returned to the "Wings" location by automobile, not by "ship."

"Stills Move The Movies"

By John Stillman

EDITOR'S NOTE

(In the reproduction of these stills, the values were greatly impaired by too great reduction. A still must be complete in detail for proper analysis. In the hurry of going to press there was no time to change the art.—Editor's Note.)

"Laugh and the world laughs with you!" An old slogan but always effective in its meaning and one that has been put into actual practice by the movies for the enjoyment of the little ones and of the grown-up little ones too.

"How silly," we have all heard many times between chuckles and frank outbursts of laughter during the screening of a motion picture farce.

"How silly," may be true, but still the beneficial effects of laughter are stimulated and the picture has answered its purpose.

Now, folks, we are going to let you into a little secret if you promise not to let it interfere with the pleasure that you will derive from the next "silly" picture you will have the opportunity to see on the screen.

All this silliness, all this laughter, is the result of WORK, often of very hard work that leaves little or no time to frolicking thoughts.

Making comedies is a serious business, a very serious business which requires much thought, preparation, care, understanding of human nature, real humor, which explains the outburst of a certain producer, who in answer to a rather sarcastic criticism of one of his pictures, heatedly exclaimed: **"This comedy is not to be laughed at!"**

A comedy may be compared to an agile acrobat, who in a fleeting second performs a feat of daring and precision with a grace that seems superhuman and with no apparent effort, but back of which are marvels of level-headedness, clean habits, self control mental and physical, accumulated through years of self-sacrificing intensive training.

This seems to be quite an obtrusive preamble to the presentation of a few "funny" stills, but as we are in the photographic "business" we like to look at things in a business-like way and combine both the artistic and the commercial values of our product.

Now, which should be the requisites of a "still" destined to advertise and "sell" a comedy photoplay?

It has to be "funny," of course. It doesn't take a genius to find that out; but, what is it that makes a still picture funny? This is another question.

In a comedy photoplay, a story of some sort is always carried on, replete with comical situations cleverly arranged so as to create and sustain the farcial whole of

the picture and an audience is usually "carried" by stunts, thrills and situations following each other in rapid succession, that make the whole pleasing and comically entertaining. But what of the still-cameraman? He has constantly to follow every footstep of the company to which he is assigned, constantly to study the situations most of which are improvised right on the spot; he has to be constantly ready to catch with his camera the fleeting instant that will tell a story and a "funny" one at that.

Accuracy, speed, a keen sense of humor together with a thorough knowledge of photography are required of a comedy-still cameraman.

Experience tells us that "action" pictures are the most successful in bringing out the farcical qualities of a subject and this, assumed and accepted as a fact, the comedy-still-cameraman, began to figure out how to reconcile action and speed with the sharpness that is essential in all details of a comedy still.

It is a well known fact that depth of focus or complete sharpness of a picture is secured at a sacrifice of the speed of the lens used in taking the picture and that less depth of focus is obtained with lenses of same speed, but covering a larger area under similar conditions of subject and lighting.

And here surged one of the great problems the solution of which is responsible for many sleepless nights spent by the comedy-still-cameraman.

The cinematographer in charge of production arranges his lightings according to the different effects he wants to obtain and to the "speed of the lens he is using" in order to register the action upon the small surface of a picture "frame," and this arrangement, for the reasons explained above, is always insufficient for the still man who has to "grab" the picture while the action is going on.

This problem has been solved as is proven by the few stills from the Christie Studios, of Hollywood, that embellish this story.

Jimmy Adams and a confederate trying to force a bath upon the elephant, and Bobby Vernon extinguishing the fires that burn within him, are excellent results obtained in interior action-still-photography.

The flag-pole stills of Billy Dooly, though easier to obtain, being exterior pictures, give action a plenty through the impression of danger conveyed by the dizzy position of Dooly. The picture of dear old Jack Duffy and the rabbit is, in our estimation, one of the finest examples of humorous snap photography carrying as it does a whole story with it and a pleasantness of effort very seldom recorded.

The pastel-like background suggestive of happy sunlit mornings and rural peace, beautifully contrast with the bushes in the foreground suggestive of thorns and ambush, declared enemies of frock-coats and silk-hats, and the suggestion of a wild chase after the rabbit, through the open fields and ending in the bush, is completely carried out up to the climax of the capture. And here the mind pauses and—well—read the story yourself, or still better, try to find out how many stories you can read into the subject and we venture to say that you will not regret the time you will devote to it.

* * *

The writer of this yarn was paying a visit to the Christie "lot" recently when he espied these pictures and was gracefully accorded the privilege of using them in the "American Cinematographer."

Mr. Talbot, the photographer of many of them, was present and the writer viewing such an array of remarkable stills, and spurred by his own knowledge of the difficulties involved in such work, could not refrain from asking Talbot the "silly" question: "How do you do it?"

"Well," was the answer, "it all depends on the lens, and the shutter and the developer—"

"And the man behind all these things," the writer added.

"I am afraid they will be looking for me on the set," was Talbot's conclusion, and he hurried away.

And this, to prove that modesty can still walk together with success.

Combination Control Switch For Model C Kodascope

By HAMILTON RIDDEL

As the Model C Kodascope is equipped it has but a single switch. This control lights both the lamp and starts the motor in one operation. However, it is often convenient to be able to exercise a separate control in the operation of the projector. Two instances are self evident. One occurs when the operator wishes to operate the machine by hand, thus doing away with the necessity of keeping the motor running. The other, and one which is quite important to the careful home-projectionist, is the matter of allowing just titles and actual pictures to reach the screen without the annoying and trying effect of having a white beam of light flare upon the screen at the beginning and end of a reel in projection.

For these two reasons the writer adapted a combination control switch to his Kodascope. The attached switch is shown in the accompanying illustration. The two "click" switches were mounted inside of a metal box, the latter being screwed to the top of the motor. Proper electrical connections were made so that the light and motor could be operated separately.

When operating the Kodascope by the hand crank, the motor is turned off and only the lamp switch is turned on. In the second instance, already mentioned, the lamp is lighted while focusing is effected. The motor switch is then clicked on and projection follows. With the appearance of the closing scene or title of the reel, the lamp switch is turned off, the motor still being allowed to run. Thus the projected picture ends, not being followed with a white flare which passes through the empty gate, and yet the end of the film is rolled upon the take-up reel by the motor which is still in operation.

There are several places where this combination control switch may be mounted on the Kodascope, model C. To those, however, who have the small carrying case for their projector, it will be found that the switch is most conveniently placed on top of the motor. So attached there is enough clearance to store the projector in the standard carrying case.

The Technology of Glass

By FRED MCBAN
Physicist of Creco

Since glass is more or less necessary to our work in motion pictures, a semi-technical glossary on the manufacture and uses of it, should be of interest to us.

Glass, as generally classified under the name, is a translucent or transparent mixture of silicates, or sand derivatives, one of which is usually of a metal base.

Calcium carbonate, lead oxide, sodium carbonate and potassium carbonate are the main constituents of glass, be it camera lens or rhinestone.

Sodium-calcium, window glass is easily affected by the elements, becomes porous when used under certain circumstances and is practically useless for chemical apparatus and measuring or graduating glasses such as we use in photographic dark-rooms and laboratories.

For this reason we use a glass made by the Bohemian process, a method of making glass, comprised of Silica, Calcium and Potassium Carbonate of the highest purity. The product of this process is characterized by extreme hardness and resistance to chemical reactions.

Flint glass, one of the fundamental bases of photographic and optical lenses, is manufactured by smelting together lead-oxide, Silicon-oxide and Potassium Carbonate. This combination gives great refractive power, along with a low melting point and high specific gravity, making it easy to work for trueness and rendering in the course of manufacture.

Crown and flint glasses, almost exclusively used in the making of photographic lenses, are manufactured in a great number of varieties, obtained by incorporating in them different metallic elements, which, in changing their densities, change their power of refraction and dispersion.

Strass or German glass is of the lead base variety. Being very rich in lead it follows that its refractive power is very high and for this reason it is used to make rhinestones, artificial diamonds, etc.

The various colours in glass are obtained by mixing heterogenous mineral and vegetable colourings with the liquid or molten mass and not by the temperature of the mass while it is in the furnaces, as we are sometimes led to believe.

Cobalt compounds enter into the manufacture of blue glass, which is used quite extensively at this time in photographing close-ups shots in cinematography.

The only advantage, if any, that can be claimed for the use of blue glass is as a diffusing medium or a slight psychological effect.

Copper chrominium compositions are used for green glasses, oxides of copper for the reds, and uraniums for the ambers and yellows.

Common bottle glass is composed of sand, limestone, sodium sulphates, common salt, etc., according to the color or intensity of color desired.

The slower the cooling of the glass after it has been brought from the pot and molded the better its quality. The gradual reduction in the temperature is accomplished by means of a long oven, known as the annealing oven and the operation is called the annealing process.

When red-hot glass is introduced into heated oil or paraffine wax, which is a process of hardening, we have the method by which the various forms of heat-resisting lenses and heat absorbing glasses are made.

This latter is a form of glass that the studios are greatly interested in at present.

Pyrex glassware, the kind we use for domestic purposes, is made by this method, i. e., by dipping it in oil while red-hot. This process is generally supposed to be a trade secret.

A Camera You Can't See

Mr. W. S. Ashby, Vice-President and General Manager of the Seebold Invisible Camera Corporation, Rochester, N. Y., sends the "American Cinematographer" the following description of that organization's Invisible Camera. Says Mr. Ashby:

"It is rather hard to display a thing that is invisible. Invisible Camera is not a magical device; it is invisible because it is concealed.

"The original idea of this camera was to photograph bandits or hold-ups in action. It was designed to install in banks, stores, filling stations, mail cars or other places which might be in danger of robbery.

"The camera measures 8½ inches high, three inches front to back and six inches in width. Those installed in banks will be enclosed in bullet proof steel cases. The camera can be concealed in the wall or can be put in any sort of a cabinet large enough to hold it.

"The lens opening is five-eighths of an inch. It uses one of our ultrastigmat lenses F: 1.9 The pictures are made on standard motion picture film and are one inch square.

"The magazine holds about sixteen feet of film, enough for one hundred and sixty pictures.

"The camera may be operated by a floor button or any other electrical connection desired A touch of the button makes one exposure. After the exposure the film automatically rolls up ready for the next picture. A continuous pressure of the button makes a series of pictures. The moment the pressure on the button is released the camera stops. If the contact continues the entire roll of film will be used up.

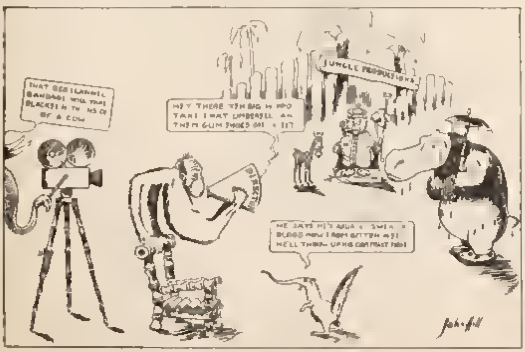
"The instant the last exposure is made the camera signals that it is out of film. This signal is optional with the owner, whether a light is turned on or whether a buzzer or bell is sounded.

"With the exception of the instant that the lens is exposed, there is nothing to indicate that there is a camera in the room. We have one installed in a filing cabinet at the factory and at a little distance a person would never suspect that the cabinet contained a camera.

"The General Electric Company has completed for us an arrangement that operates by a light. A ray of light is thrown on an electric cell. The moment that light is interrupted the camera operates.

"To cover a room it would be necessary to have four cameras, one set in each wall. They may all be controlled by the same button. Or if the bandit walked through a ray of light all four cameras would click. If he should shoot the light out it would continue to make pictures.

"We also have a flash light set in the electric wiring, which looks like a fuse, for night work. The camera can either operate the flash or turn on sufficient illumination under ordinary office illumination."



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CLUBBING RATES

	U.S.	Canada	For'n
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"Camara Craft"	3.90	4.65	5.40
"Photo-Era"	4.15	5.00	5.90
"The Camera"	3.90	4.40	5.40

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Rates: Four cents a word. Minimum charge one dollar per insertion. All copy must be prepaid and must reach us before the fifteenth of the month preceding publication.

American Cinematographer,
1222 Guaranty Building.
Hollywood, California

WANTED—MOTION PICTURE CAMERAS

170-DEGREE Bell and Howell wanted Have 1924 Buick Sport Touring car, in excellent condition, as down payment Remainder to be paid within six months of purchase Write or phone Herman Schopp, care of the A S C., 1219 Guaranty Building, Hollywood, California GRanite 4274 or GRanite 4704

FOR SALE—CAMERAS

FOR SALE—De Vry Projector using standard film. In first class shape—$100 Cost $225 new (See the machine in the A. S C office 1220 Guaranty Building, GR 4274)

FOR SALE CAMERA—Super-speed Debrie equipment 2-inch R & L Lens 2 magazines 1 tripod, 2 jacks Price $750 00 Abe Scholtz Sec camera in A. S. C. office GR 4274.

FOR SALE—New Eyemo camera, carrying case, extra magazine. Price $225 Call Ben White OX 7335.

FOR RENT—CAMERAS

FOR RENT—Akeley Head. Cinemotor, batteries and Eyemo. Frank M Cotner HO 5046

FOR RENT—To reliable party, one Bell & Howell camera with Mitchell legs; Astro Lens F 2.3 Fl 8, 6 magazines. Fred Hoefner mat box In perfect shape and fully equipped. Joe LaShelle ORegon 6730

FOR RENT—Two Bell & Howell cameras, large finders, astro lenses F 2 3 B & L 2 7 Also Akeley Head cinemotor, batteries and Eyemo Frank Cotner, HO 5046

BELL & HOWELLS, Mitchell Speed Camera, Akeley Camera, special 17-inch Dahlmeyer lense. John Jenkins, GRanite 2174.

FOR RENT CAMERA—3 Bell & Howells Fully equipped Lenses 2.3, 2 5 and 2 7 Large finders, Baby tripod. No 6 Lense Special side prism Also Special Hi speed DeBrie Call B B Ray A S. C Office, GR 4274 Home, OL 2727, 1115 N Edgemont Ave

MITCHELL and Bell & Howell cameras. F 1 6 and F 2.3 lens equipment All kinds of lenses and equipment for rent John S. Stumar 3602 Cardiff Ave, Palms, Los Angeles. Phone Culver City 3542 or call C. Glouner, Camera Dept, Universal City, HEmpstead 3131.

ONE DE VRY Motion Picture Camera Complete outfit Alvin Wyckoff, Phone Care A. S. C., GRanite 4274.

FOR RENT—Akeley camera to responsible parties Call A Le Roy Greiner, A S C GL 7045.

THREE Bell & Howell 170-degree cameras Complete equipment Eddie Linden, 5017 Eleanor Ave, Hollywood, HEmpstead 8333 or Hollywood 7715

CAMERAS, ALL KINDS—Akeley, Bell & Howell 170°, also Speed, De Vry, Graflex, Still, (late model Anscos). For rent by day or week to responsible parties Ries Bros, Ries Building, 1152 No Western Ave Phone GRanite 1185 Residence HO 1055.

BELL & HOWELL. Victor Milner, 2221 Observatory Ave., Los Angeles California. 556-044.

BELL & HOWELL—Phone Perry Evans, DUnkirk 3690 or Hollywood A S C.

MITCHELL Friction Tilthead, 3 Mitchell cameras, 2 Bell & Howell Astro F 1.8 F 2 3 lenses Extra lenses and magazines J. R Lockwood 523 N Orange St Glendale. Glen. 3361 W. Hollywood address, 559 Seward, HO 4366

E. BURTON STEENE Bell & Howell, and Akeley. Complete Camera equipment Latest models Address American Society of Cinematographers, Hollywood, California.

BELL & HOWELL, 170, with 30, 40, 50 and 75 lens equipment Baby tripod Also B & H. Cine motor. Charles Stumar. CRanite 5845 7501 Lexington Ave, Hollywood

BELL & HOWELL No 527. Five lenses: 32, 40 (f.2.7), 50 (f 2 7), 75, 100 mm Complete studio equipment; gauzes, filters, etc GLadstone 0033.

TWO Bell & Howells. Large finders. Also Eyemo for rent. Lenses: F 2 5, 2 3; 2.7. Frank M. Cotner, 6273 Selma Ave, Hollywood HOllywood 5046.

SPEED CAMERA: Bell & Howell, fully equipped for miniature and slow motion work 40, 50, 75 mm. and 6-inch lenses Alvin V. Knechtel, 1176 North Kenmore. 557-054

FOR TRADE—CAMERAS

WILL TRADE—Carl Zeiss, F 3.5, 50 mm. lens in B & H. mount Trade for late model Veedor Counter. Bert Longenecker, 597-724

FOR TRADE—Have good Ereman standard 35mm film printer 50 cycle ¼ H large light dimmer, 24 stops in very good order, good contact. Will trade for a Universal or other good make tripod Printer regulated to print from 13 to 20 feet per minute Address World Wide Out Door Motion Picture Co., 1114 Fifth Street, Sioux City, Iowa.

FOR RENT—STILL CAMERAS

ONE 8x10 still camera—complete Care A. S G., GRanite 4274.

FOR SALE—LENSES

FOR TRADE—New 100 ft Stineman Developing Outfit One Reel, Three Tanks Also F 3.5 Bausch & Lomb Tessar in Focus Mount with Diaphram and Sun Shade Exchange for Tripod Must be steady George Horst, 1524 Green St., Philadelphia, Pennsylvania

FOR SALE, LENSES—Carl Zeiss, F 3.5, 50 mm., mounted in latest B & H mount. Looks like new Perry Evans, 413 No Mariposa Ave, Hollywood, California.

ONE two-inch Bausch & Lomb F.2:7; one Dahlmeyer Pentac 37 mm F.2.9 Georges Benoit care of American Society of Cinematographers, Hollywood California

CARL ZEISS, F. 2 7, 50 mm in Bell & Howell mount. Dan Clark, care American Society of Cinematographers

NEW 40 mm. Goerz Hypar f. 3. 5 lens in Bell & Powell mount price, $50.00. Write Charles Clarke, 1222 Guaranty Building, Hollywood, California.

RUO LENSES—Sole U. S. Agent. Robert Ackerschott, 1575 N Vine St., Hollywood. 25 mm to 100 mm., F 2. and F. 2 5 (Latest type Telephoto, 10-inch, F. 4 5)

FOR RENT—Mitchell f. 2 3 Astro lenses. Brand new outfit GLadstone 0033

WANTED—PROJECTOR

USED SIMPLEX wanted. State model price, condition, etc Address Box R American Cinematographer

WANTED—MISCELLANEOUS

WANTED, CAMERA—Will buy Bell & Howell camera. State price and equipment John P Whalen. GI 1101 or A. S C. GR. 4274.

WANTED, CAMERA—170 degree Bell & Howell camera. Would like Mitchell tripod Harry H. Cooper, 851 No. Fuller Street. Phone GL 5230.

FOR RENT. LENSES—Trick lenses of all descriptions for rent by day or week Call George Meehan A. S C Phone GR 3830, 744 North Curson Ave, Hollywood, California.

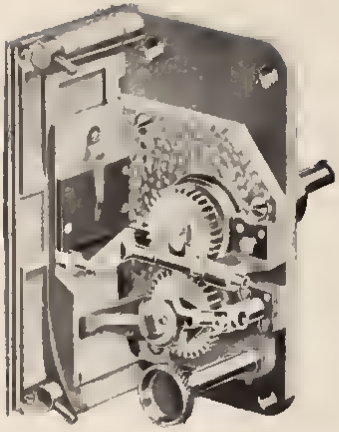
WANTED—Will buy Bell & Howell cinemotor and a 32 M M. Lense Call Herman Schopp, HOlly 4735 or care A S. C office, GR 4274

FOR SALE—SPECIAL CAMERA EQUIPMENT

COMPLETE new style Bell & Howell matt box for sale. Joseph B Walker, 1037 N. Sycamore Ave, Hollywood. Phone GLadstone 3797

FOR SALE—100 ft. lengths of raw film with 10 ft. black leader on each end, suitable for hand camera $3.25 each. John Jenkins, 5845 Sunset Blvd., Hollywood, Calif.

PATHE panorama head for professional camera, with detachable aluminum tilting head, easily adapted to any standard tripod A first-class unit for some one, who is experimenting or engaged in research work to add to their equipment Stephen S. Norton care A. S C., Guaranty Bldg, Hollywood.



Announcing

The NEW HI-SPEED MOVEMENT for our camera, which has been in the field long enough now to have proven its merit.

This movement will operate equally well at all speeds from one picture per second to eight times normal, or One Hundred and Twenty-eight pictures per second. It has been run as high as One Hundred and Sixty pictures per second, but we recommend that eight times normal will give perfect results with no strain on the mechanism.

The pull-down arm has two fingers on each side, engaging four perforations simultaneously, thereby insuring against tearing of the film when operated at high speed.

Registering pins are provided, moving in hardened and extremely long bushings, which will guarantee long wear and perfect registration. Two pins are provided, one at each side of the film, both pins being mounted on the same operating arm so that registration must be correct.

Movement can be operated either backwards or forward with equal efficiency, and function perfectly. Fade-outs can also be made at high speed if desired.

This movement is a typical MITCHELL development.

Mitchell Camera Corporation

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